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Too Small to Forget: An Analysis of the Changing Banking Industry and the Continuing Importance of Smaller Institutions

Michael A. Flaherty
University of Connecticut - Storrs, michaelflaherty@outlook.com

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By: Michael A. Flaherty

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Abstract:

Since the early 1980s, the United States banking industry has undergone a variety of structural changes. In 1980, there were over 14,000 banking institutions; now, there are about 6,000 institutions remaining. In addition to the declining number of institutions, industry assets have become more highly concentrated in several very large institutions. For example, the percentage of industry assets held by banks with $10 billion or more in assets (adjusted for inflation) has increased from about 46% in 1992 to 80% in 2012. Many of the structural changes came in response to a changing regulatory environment. Banking regulations began to shift dramatically both nationally and internationally in response to the growing complexity of modern banking and to the Savings and Loan Crisis in the late 1980s. As a result, large, national and international institutions were able to achieve greater operating efficiency and profitability through changing business models with a focus on large transactions. As banks achieved cost savings with larger scale operations, the number of institutions declined while assets became more concentrated among those that remained. This fact has wide-ranging implications for the future of the U.S. banking industry, including the future role of different sized banking institutions in relation to different types of customers. Even with the changes, smaller institutions have an important role to play in the banking industry and the economy. Indeed, despite consolidation, many of the new entrants to the banking industry have been smaller firms. Generally, these smaller institutions provide a different set of products and services than do larger institutions. Accordingly, they earn income in a different manner than larger banks, usually earning more interest income and less non-interest income than the larger banks. Regulatory change in response to the financial crisis may limit the amount of leverage used by larger banks and reduce non-interest income, greatly reducing two historic advantages larger banks have held over smaller banks. As a result, the post-crisis world may present significant opportunities for smaller institutions.

I. Introduction

Over the past thirty years, few industries have undergone the amount of change seen in the U.S. banking industry. A number of different forces have resulted in a modern banking industry that looks vastly different than it did just a few decades ago. These changes have run along two dimensions, affecting both the number of institutions and the concentration of assets within the industry. From the 1980s through today, the number of banking institutions has declined significantly. Over that same time, the number of extremely large "mega banks" has increased. The implications of having extremely large banking institutions that can face failure in a financial crisis became clear during 2008 as many of these large banks needed public assistance to make it through the crisis. In response to these near failures, the U.S. government responded by making significant regulatory changes to the banking industry. New regulations are sure to influence how the banking industry evolves in the future.

Seemingly lost in the discussion about the future of the banking industry is the role of smaller institutions that, while diminished in number (historically speaking) due to industry consolidation, remain a vital part of the U.S. financial system.[1] Remembering to include smaller banks in the discussion is important because in many instances, smaller banks serve a different set of customers and provide a different set of services than large institutions. Although their smaller size limits the geographic area that they serve, smaller institutions can be very important to the specific communities that they serve.

[1] Some countries, such as Canada, operate with a small number of very large banks that service both large and small customers. The trend towards consolidation in the U.S. has made some question whether we are moving towards such a model.

The changes the banking industry has undergone are part of a broader change in the financial services industry. Financial intermediation as a whole has changed significantly since 1980. Financial intermediation, or the process of collecting funds from persons or entities with excess funds and allocating those funds to persons or entities needing funds, has become increasingly fractionalized between "traditional" and "non-traditional" intermediaries. Traditional intermediaries include banks, insurance companies, and pension funds; examples of non-traditional intermediaries include mutual funds, hedge funds, and finance companies. Today there is greater variety of financial intermediaries than in the past. For banks, this fact changes the competitive landscape, increasing the amount of competition that banks face. Part of the other non-traditional intermediaries' success comes from a lower regulatory burden compared to the regulatory burden that banks face. For banks, this fact is somewhat unsettling in the face of regulatory reforms announced since the financial crisis that mainly affect banks. Also behind the fractionalization of financial intermediation, are changing investor risk preferences. Many of the newer intermediaries provide products and services that are higher-risk and higher-reward than traditional bank deposits. Examples of these products include mutual funds, which have seen tremendous growth since 1980. At the same time, access to direct credit markets by U.S. corporations has created a trend known as disintermediation, or the removal of funds from traditional financial intermediaries into the direct credit markets. As a result of the fractionalization of financial intermediation and disintermediation, the banking industry does not control the same percentage of financial intermediary assets as it historically has. From 1980 to 2012, the banking industry's share of financial assets has fallen from 54% to

29% while total assets for all intermediaries have increased from $4 trillion to $50 trillion over that span.

Despite these changes, the banking industry provides a number of essential services that benefit the population and the economy. These services are the keys to its importance going forward. One major service it provides is the provision of a payments mechanism so that individuals and businesses can purchase goods and services with minimal transaction costs. The banking industry also provides loan products to individuals and businesses, helping them smooth consumption over time, finance new investment, and small business growth. Lastly, the banking industry is the conduit through which Federal Reserve monetary policy flows. Because of these essential services, banks will remain an integral part of the economy even in the face of the changing nature of financial intermediation.

While all banks provide these fundamental services to the economy, within the banking industry, there is tremendous variation in the types of services and products provided by individual banks. Institution size heavily influences what types of activities a bank is involved in. Generally, larger institutions provide a wider range of more complex services than do smaller institutions. Consequently, larger banks derive more of their income from non-interest income than do smaller banks. Smaller institutions generate most of their income from interest income as a result of lending activities. Analysis of overall bank profitability (as measured by pretax ROE and ROA) shows that larger institutions have been more profitable than smaller institutions since the early 1990s. The analysis shows that larger banks have had higher operating margins while using more leverage. Ultimately, this has led larger institutions to be more profitable than

smaller institutions. However, the financial crisis and its aftermath have fundamentally altered the banking environment and the historical relationships between small and large banks, providing a significant opportunity for smaller banks going forward.

Both the financial crisis and the subsequent slow recovery have been challenging for the banking industry. One of the results is the need for many banks to recapitalize and deleverage. Market forces and regulatory pressure are behind this recapitalization effort. Although banks have already changed their behavior and begun to recapitalize, the industry as a whole continues to wait for final regulatory rules to be issued. While regulatory rulemaking is ongoing, U.S. regulators are expected to exempt smaller institutions from some of the reforms, especially Basel III. This is in response to the differences between large and small banking institutions as smaller institutions are less likely to engage in systemically risky activities. Furthermore, the failure of individual small banks poses little systemic risk while the failure of one of the largest banks has negative ramifications for the whole financial system. Additionally, smaller institutions as a group did not become overleveraged before the financial crisis. Since smaller banks have already been doing business with lower leverage, smaller institutions may hold an advantage over larger institutions going forward.

The rest of the paper is organized as follows: Section II discusses the financial intermediary function and how it has changed over time. This section will also detail the types of services provided by banks and the role of regulation in the banking industry. Section III analyzes U.S. banking institutions and the differences between large and small banks. It begins with a discussion of the differences in the balance sheets of the largest and smallest institutions

and concludes with a decomposition of banking industry profitability broken down by different sized banks. Finally, Section IV discusses current issues in banking and examines the future of the banking industry in a forward-looking manner.

II. Functions of Financial Intermediation

At its root, financial intermediation exists to coordinate investment between those with excess funds and those seeking funds to invest. In order to accomplish this task, financial intermediaries create investment products that are attractive to those who have excess funds and loan products that are attractive to those with investment opportunities but are in need of funding. In doing so, banks provide traditional brokerage services (bringing buyers and sellers together), but also an intermediate role whereby they take on certain risks – including maturity and credit intermediation risks. By going through an intermediary, both buyers and sellers of funds are better off than if they did not go through an intermediary.

Following Kidwell (Kidwell 2000), financial intermediaries provide five main benefits to their customers: denomination divisibility, currency transformation, maturity flexibility, credit risk diversification, and liquidity. Denomination divisibility involves making investments in direct securities of different sizes. It is not possible for small savers and investors to invest in a loan or security with a large face value. However, with a financial intermediary that pools funds, small investors can invest directly in a larger number of securities. Currency transformation helps U.S. companies that buy and sell goods globally in currencies other than the U.S. Dollar by providing conversion and payment services to fuel international expansion by U.S. firms. Maturity flexibility is performed by institutions that create products for borrowers and savers with a

wide range of maturities. Examples for borrowers include loans of different maturities such as a 15-year versus a 30-year mortgage; examples for savers include investments with different maturities such as demand deposits (no maturity, available on-demand), CDs, and bonds and other securities. Credit risk diversification is achieved by financial intermediaries as they take pools of money from savers and invest the pooled money into a wide range of different securities to spread risk more evenly across their portfolios. Liquidity products enable consumers and businesses to quickly convert an asset to cash to meet an obligation without making large price concessions. Again, demand deposits are a good example of an intermediary providing liquidity because the investor can withdraw the funds at face value at any time (Kidwell 2000, 33-38). In the process, they improve the allocation of capital to investment opportunities and improve the welfare of savers relative to a world without financial intermediaries.

In the U.S., financial intermediaries take on a number of forms, providing services ranging from banking and deposit-taking services, insurance services, general investment services, pension investment services, and market-making services. Table 1 shows examples of intermediaries that provide each of these services. In each case, the intermediation process works in the same way: financial institutions gather funds from persons or entities that have surplus funds and transfer or allocate funds to the people or entities that have investment opportunities (Kidwell 2000, 35-41).

For U.S. financial intermediaries, the last few decades have been a period of substantial growth, with assets growing from a little over $4 trillion in 1980 to just under $51 trillion at the

end of September 2012 (Federal Reserve Board of Governors, *Z1 Statistical Releases*, 1975-2012). In 1980, financial intermediary assets equaled 145% of GDP; in 2012, financial intermediary assets had grown to 318% of GDP. The overall growth in assets is displayed in Figure 1, plotting industry assets over time while breaking down the amount of assets by type of institution.

From 1980 through 2012, the U.S. financial system saw a great deal of change in both its size and the variety of activities undertaken. During this time, financial intermediaries grew at an average annual rate of 12.2%. Table 2 shows the average annual growth rates (measured in terms of assets) for each type of intermediary. Overall, mutual funds, money market mutual funds, hedge funds, pension funds, and broker-dealers grew faster than the group of financial intermediaries as a whole. Depository institutions lost market share, growing at 9.0% over the twenty-two year span. In general, depository institutions and other traditional intermediaries have been losing market share to less regulated entities.

Figure 2 illustrates the changes in market share since 1980 and shows two main trends. First, the share of assets held by depository institutions as a percent of total industry assets has declined from 54% in 1980 to 29% in 2012. Second, mutual funds have increased their share of industry assets from less than 2% in 1980 up to 19% in 2012. In many regards, these two trends run in conjunction with one another; rather than relying on savings accounts and time deposits as the main form of investment, as had historically been the case, American savers have become interested in products that offer higher potential returns in exchange for greater risk. Financial innovation and changes in technology have enabled more individuals to become more

directly involved with the financial system while making use of more complex financial products. Examples of financial innovation include the rise of bank money market mutual funds and products such as IRAs and 401(k)s that have met increased consumer demand for equity investment.[2]

Another major trend that has taken place is disintermediation, which occurs as funds previously invested through a traditional financial intermediary are instead placed directly in the credit market. The first instance of disintermediation in the U.S. financial system occurred before the 1980s. Regulation Q placed a ceiling on the interest rates that depository institutions could pay on savings and NOW accounts and prohibited depository institutions from paying interest on demand deposits.[3] As a result, whenever market rates exceeded the ceiling, depositors would withdraw their money from depository institutions and move it into money market mutual funds. Appendix A has more specifics on this period of disintermediation. In the 1980s, disintermediation occurred as a result of financial innovation and technological advancement. One such innovation was the increased use of securitization beginning in the mid-1980s. In securitization, a bank or other intermediary makes loans as it usually would. Instead of holding the loans on its balance sheet, the intermediary sells them to investors. Those originating the loans package and pool the loans into a single security that can be broken into smaller pieces to be sold to other investors in exchange for the right to a certain amount of the cash flows from the underlying loans. For example, a $1.7 billion mortgage loan on

[2] Bank deposits hold a 100% guarantee (up to FDIC insurance limits), very few restrictions on withdrawals, are very safe, and are very liquid. Mutual funds offer a number of different investment opportunities – ranging from money market funds to high-risk volatile equity funds.

[3] Interest rate caps were repealed in 1986; banks were allowed to pay interest on demand deposits beginning in 2011. Regulation Q was designed to protect banks from unfettered competition for funds that could lead to failures.

Rockefeller Plaza was securitized and sold in small units to a variety of investors who were not capable of originating such a complex loan, or taking on almost $2 billion in a single risk (Cleary Gottlieb 2005).

Even though depository institutions' share of industry assets has declined over the past few decades, they remain an integral part of the financial system. For one, depository institutions are still the largest single category of financial intermediaries. In addition, depository institutions are such an integral part of the economy that they are government-regulated and insured. While depository institutions have not grown at the same rate as other intermediaries, they still provide critical services – providing a payments mechanism through checks and credit cards, short-term loans to businesses, financial services for consumers, including mortgage loan origination and servicing. Examples from both recent and past history (the financial crisis[4] and the Great Depression[5]) show the importance of healthy depository institutions to the functioning of the economy. As such, it is important to study banking regulation and its relation to the size and structure of the banking industry while linking these characteristics to the type of services desired by the public.

Even as the banking industry provides services to the economy as a whole, it also serves people on an individual level. Without the presence of banking services, it would be difficult for individuals to smooth their consumption patterns over time. For example, allowing individuals

[4] The FDIC was created in the middle of the Great Depression. As such, it does not have data on the total number of bank failures during the period. However, the Richmond Fed shows that bank failures numbered in the thousands in the early 1930s. Additionally, uninsured losses to depositors ran extremely high during this time before the creation of the FDIC (Walter (2005), 44).

[5] The two largest bank failures in 2008 were Washington Mutual Bank ($307 billion in assets, making it the largest U.S. bank to ever fail) and IndyMac bank ($32 billion in assets). These banks were acquired by JPMorgan Chase Bank and OneWest Bank, respectively. Overall, 347 commercial banks failed from 2008-2011, compared with only 55 failures from 1994-2007 (FDIC Bank Failure Data).

to move future consumption to the present through the use of loans enables individuals to enjoy a smoother consumption pattern than they otherwise could without a loan. The economy as well as individuals would be worse off if they had to slowly accumulate enough savings to buy assets such as houses or cars rather than taking a bank loan to make purchases. Of course, the price to individuals for this service is a steady stream of payments to the bank including interest. Although it can be said that banks and financial markets do not always operate under this idealistic view of seeking the benefit of individuals all the time, overall, banks ultimately exist because they provide services (largely investments, loans, and payment mechanisms) that individuals cannot find elsewhere. By providing these services, banks leave society as a whole better off than if they did not exist.[6]

Services Provided by Banks

The U.S. banking industry provides three main services to the economy. These services include banking and financial services to individuals, and banking and financial services to businesses, and the transmission of Federal Reserve monetary policy.

[6] Indeed, when examining the history of U.S. banking, the founders of the first U.S. savings institution were motivated by helping those not served by existing institutions (i.e. those who were not very wealthy). The Philadelphia Savings Fund Society was founded in 1816 by a group who saw the need for the services they could provide, seeking "to promote economy and the practice of saving among the poor and laboring classes of the community – to assist them in the accumulation of property that they may possess the means of support during sickness or old age" (James M. Willcox (1916), 25).

In a similar way, credit unions came to the United States about one hundred years after the opening of the Society. Originally created in Germany, credit unions became popular during the 1920s as larger manufacturer's consumer goods became more prevalent. Most consumers could not afford to pay cash to buy a car or other large household goods. At the time, savings and loan associations and commercial banks did not see the profit potential in providing small consumer loans. As a result, credit unions grew to fill the credit needs of middle and lower income households (NCUA, April 1, 2013). Today, credit unions hold almost $900 billion in total assets, representing approximately two percent of financial institution assets (Federal Reserve Board of Governors, *Z1 Statistical Releases*, 1975-2012).

Services Provided to Individuals and Businesses

Banks collect deposits or issue other forms of debt to borrow money to fund assets such as loans and securities. Collecting deposits by offering a variety of savings vehicles is one of the most important services that banks offer because they provide a payments mechanism to consumers. Savings products can be broken down into two main categories – transaction and nontransaction accounts. Generally, transaction accounts include accounts such as demand deposits (checking accounts), which customers can withdraw "on-demand". Nontransaction accounts are intended more as savings vehicles for longer-term use. Examples of nontransaction accounts include money market deposit accounts[7], savings accounts, and time deposits (CDs). At the end of the third quarter 2012, transaction accounts made up about 16% of bank deposits while nontransaction accounts made up the remaining 84% of deposits (FDIC SDI). In addition to using transaction accounts as a payments mechanism, having a means of safely saving excess funds benefits depositors because deposits are insured by the FDIC.[8] Insured deposits offer an important benefit to individuals because they are risk-free assets, enhancing the overall returns of an individuals' portfolio.

Banks use funds received from customers or from the capital markets to fund loans (primarily mortgages) or the purchase of securities.[9] These activities allow banks to provide funds to entities or individuals planning positive NPV projects – such as buying a home, starting

[7] Money market deposit accounts differ from checking accounts because there are limits on the number and/or frequency of withdrawals and may have higher minimum balances and other restrictions in return for higher interest rates.

[8] Up to $250,000 per depositor, per institution, per account ownership type http://www.fdic.gov/deposit/deposits/insured/basics.html

[9] Capital markets involve buyers and sellers of capital. For example, a firm needing capital to expand operations or for another purpose accesses the capital markets by issuing stock or bonds; in exchange for giving investors shares of stock or a bond, the company receives capital from investors.

a business, or investing in infrastructure. In exchange for providing these services, banks earn income in the form of a spread between the return earned on assets and the cost of liabilities as well as from fees charged for specific services. Later in the paper, Section III breaks down bank profitability by source.

As far as specific services offered, banks today offer a variety of deposit and investment accounts to both business and individual customers. In addition, banks offer a variety of loans. For consumers, banks offer mortgages, home equity, auto, personal, credit card, and a variety of other loans. For businesses, banks offer mortgages, lines of credit, and construction loans. In addition, banks may also offer investment or financial advisory services to consumers and other advisory and placement services to businesses. The types of services provided by banks depend largely on the bank's size. Generally, smaller banks are more focused on lending activities than larger banks and derive more of their income from lending than larger institutions. Larger banks generally provide a larger array of services than do smaller banks, and as a result, earn more non-interest income. Differences between the services provided by smaller and larger banks are addressed in detail in Section III.

The Role of Regulation in the Banking Industry

Beginning with the creation of the Federal Deposit Insurance Corporation in 1933, most banks have faced national regulation. Before the 1930s, most banks were primarily regulated at the state level with the degree and type of regulation varying significantly from state to state. Today, there are three main federal banking regulators: the FDIC, the Federal Reserve, and the Office of the Comptroller of the Currency (OCC). The FDIC regulates state-chartered

nonmember banks (of the Federal Reserve System) and state-chartered thrifts as well as insuring the deposits of all federally insured banks (up to $250,000 per depositor per bank). The Fed supervises state-chartered member banks (of the Federal Reserve System) and bank holding companies. The OCC regulates national banks and federal thrifts (Government Accountability Office 2013, 10-11).

Prior to the introduction of nationwide deposit insurance, depositors had to worry about the financial condition of and risk management at the bank they were depositing funds into because if the bank became insolvent, the depositors usually did not receive all of their funds back.[10] Although this system theoretically encourages depositors to monitor their bank, in reality, few depositors were able to effectively monitor a bank's performance. As a practical matter, this risk discouraged depositors from putting their money into the banking system, and also led to bank runs as soon as there were rumors of any bank failing (Mishkin and Eakins 2000, 515-6).

While deposit insurance helped provide stability to the financial industry, it also created several new problems. The first new problem was an adverse selection problem. That is, because deposits were protected by insurance, the overall riskiness of operating a bank was reduced.[11] This fact attracts risk-taking entrepreneurs to the banking industry (Mishkin and

[10] Prior to the FDIC, depositors faced an "all or nothing" system in which a bank would pay off depositors looking to withdraw funds until the bank ran out of money, leaving those depositors who did not make it to the bank in time without the money they deposited as the bank failed. This possibility led to bank "runs" whenever depositors heard that any bank had failed, they (and other bank customers) ran to their banks to withdraw their money before the bank ran out of money.

[11] With stable deposits, a bank can tolerate greater fluctuations to its profit without risking the loss of funding or paying higher risk-adjusted rates on its liabilities.

Eakins 2000, 517-8). Without regulatory controls, as more and more risk-takers become involved in the banking industry, the overall riskiness of the industry's activities could increase.

In addition to the adverse selection problem, deposit insurance also creates moral hazard problems. The first, called the agency problem, has two main forms: deposit insurance can lead to either overly conservative or overly aggressive operating policies (Demsetz et al. 1997, 1-2). The idea behind the agency problem is that bank managers may have different objectives (keeping their jobs) than debt and equity investors (earning returns) in the bank.

In the first version of the agency problem, bank managers choose less risky investments. Less risk hurts equity holders because they are the residual claimants. Ultimately, equity claimants want to see the underlying business take risks that will potentially lead to higher profits. Alternatively, debt investors, and especially depositors, want their money to be safely returned to them with interest and thus favor lower-risk, lower-return investments. In addition to these two competing claimants, are the bank managers who want job security. Consequently, bank managers may make investment decisions that are more beneficial to debt than equity, i.e., favor lower-risk and lower-return activities. As a result, bank equity holders do not get an adequate amount of return for the risk they are taking as residual claimants.

In the second version of the agency problem, the bank managers take too many risks. They feel that they can afford to take these risks mainly because insurance is backing up most of the bank's liabilities, and consequently, debt providers are less concerned with the banks' risks. This version of the agency problem is especially significant when a bank faces declining prospects. Knowing that the bank is in trouble, bank managers take on more risks in order have

a chance to stay solvent (Demsetz et al. 1997, 1-2). If this strategy pays off, equity benefits greatly as it does not get wiped out. However, if the strategy fails, equity will be wiped out and depositors will be made whole. By removing market discipline that would otherwise be present (depositors withdrawing their funds from a failing bank), deposit insurance can make banks take more risks than they otherwise would (Mishkin and Eakins 2000, 517).

Another issue with moral hazard is that it can also promote the "too big to fail" (TBTF) problem. This problem occurs as banks become so large that the failure of one bank could cause a major financial disruption with effects spilling over to the rest of the economy. In addition, the TBTF problem is potentially unfair to smaller banking firms (Mishkin and Eakins 2000, 519) because troubled smaller banks are usually not allowed to continue operating as troubled larger institutions are. In resolving a failed smaller bank, the FDIC either closes and liquidates the bank (usually transferring deposits to a local institution) or it facilitates a purchase and assumption (P&A) transaction in which a larger institution acquires the assets and deposits of a smaller institution (Hetzel 1991, 7).

One of the first examples of the TBTF problem was the failure of Continental Illinois National Bank and Trust Company in May 1984. Beginning in the mid-1970s, Continental Bank, the eighth largest U.S. bank by assets, began pursuing an aggressive growth strategy. From 1976 to 1981, assets grew by almost 111% while C&I loans grew by 180%. Continental Illinois' growth far eclipsed the growth of other large institutions over the same period. To contemporary observers, it became clear that Continental was going out of its way to make risky loans in order to grow its business. Once these risky loans began to go bad, investors,

analysts, credit ratings agencies, regulators, and the public became concerned with Continental's position. These concerns culminated in Continental's customers and correspondent banks withdrawing funds. To survive, Continental accessed the Fed's discount window (for $3.6 billion) in May 1984. Accessing the discount window did not solve Continental's problems and the bank had to accept a $2 billion rescue package from regulators and other banks. Still, deposits left the bank, forcing the FDIC to acquire $4.5 billion in bad loans and to give the bank $1 billion in capital in exchange for preferred shares (FDIC 1997, 235-245).

In the case of Continental Illinois, the FDIC and other regulators took never before undertaken steps to prevent the failure of a large bank because of the fear that the bank's failure could lead to other bank failures and fear throughout the banking system. As a result of these unprecedented actions, it became clear that policymakers and regulators were implicitly favoring larger institutions over smaller institutions. An obvious concern that this brought up was that the market and bank managers might begin to make assumptions that larger institutions would not be allowed to fail going forward. If these assumptions were made, large banks would take on more risks than small banks and depositors and smaller banks would have a significant incentive to grow and merge until they qualified as TBTF.

Transmission of Monetary Policy

Historically, the Fed has used open market operations, the discount window, and reserve requirements to conduct monetary policy and promote financial system stability. In its recent history, the Fed has used open market operations almost exclusively. While historically open market operations usually emphasized controlling short-term rates through the Federal

Funds Rate, since the financial crisis, the Fed has shifted to buying longer maturity securities and mortgages in an effort to manage long-term rates. These efforts, known as quantitative easing, are the result of traditional monetary policy tools being less useful when short-term rates approach zero.

Banks help the Fed transmit monetary policy to the economy through the process of providing loans and other services to customers. As evidence of how difficult it can be for the Fed to conduct monetary policy through the traditional channels, now (and also during the Great Depression), banks have accumulated significant excess reserves (about $1.6 trillion) with the Fed that are not being put into the economy. Before the financial crisis, banks collectively held zero excess reserves with the Fed. Since the Fed cannot force banks to lend, the Fed is in a difficult situation in trying to use its tools to achieve its triple mandate.[12] In order to influence bank behavior and the economy, the Fed sets reserve requirements that banks must meet. By setting a reserve requirement, the Fed ensures that banks retain a certain portion of their deposits at the Fed rather than lending the full amount of deposited funds. Reserves encourage financial stability for institutions as customers come to withdraw funds as well as promoting transactions processing (Mishkin and Eakins 2000, 220).

Open market activities are the Fed's primary monetary policy tool and have been for some time now. In using open market operations, the Fed either buys or sells securities in order to influence the money supply and the Federal Funds Rate. For example, if the Fed buys a

[12] The Fed's triple mandate is "to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates." When referring to a "dual mandate", the Fed means promoting maximum employment and stable prices.
http://www.chicagofed.org/webpages/publications/speeches/our_dual_mandate.cfm

particular security on the open market, it increases the demand for that type of security, raising its price. This action has two effects. First, as the security's price increases, its yield decreases. Declining yields mean that borrowing becomes less expensive for those seeking funds. Second, in return for buying the security, the Fed increases the reserves of the institution selling the security. In undertaking this action, the Fed hopes that banks will lend out their excess reserves. In theory, lower yields and larger reserves allow financial institutions to make more loans. As stated earlier, the success of open market operations depends on whether or not banks are willing to lend. (Mishkin and Eakins 2000, 209-13).

Traditionally, the third way that the Fed uses banks to conduct monetary policy was set through the discount window. Discount window lending is more of an emergency tool rather than something frequently used by the Fed. The Fed can influence the dollar amount of reserves in the banking system by changing the discount rate. The Fed lends to banks at the discount window in order to prevent short-term liquidity problems in the banking system. Reasons for this are that the discount window interest rate is set higher than the federal funds rate (making it more attractive for banks to borrow from each other instead of the Fed) and because of the negative stigma associated with borrowing from the discount window (Mishkin and Eakins 2000, 215-7). Figure 3 plots the Fed Funds and Discount Rates over time.

In responding to the financial crisis, the Fed found that its traditional monetary policy tools were not as effective as they had historically been. The Fed's initial response to the crisis was to lower short-term interest rates in the Fed Funds market. In the past, longer-term rates followed similar up and down movements to changes in short-term rates. In the financial crisis,

long-term rates did not fall enough in response to the Fed's efforts to reduce short-term rates, even as these short-term rates were lowered to near zero. Additionally, output and employment continued to shrink. In response, the Fed announced a strategy known as quantitative easing, through which the Fed would purchase long-term securities issued or backed by the U.S. government, including mortgage-backed securities. By buying mortgage securities, the Fed was hoping to stabilize the housing market by lowering mortgage rates. This initial round of purchases, now called "QE1", totaled $1.7 trillion from 2008 through 2010. Initially, this strategy was successful as long-term rates fell and more individuals and business were able to obtain loans. Asset prices also rose and inflation stayed low. As 2010 went on, economic growth again slowed down, and with inflation low, the Fed feared the risk of deflation. To combat this risk, the Fed launched QE2 in November 2010. This program bought an additional $600 billion in long-term U.S. Treasury securities (Steve Meyer 2011).[13]

After QE2 ended in 2011, the Fed announced another easing strategy called "Operation Twist". After having accumulated well over $1 trillion in securities and pushing long-term interest rates down, the Fed continued to believe that the economy needed further monetary policy stimulus. With short- and medium-term rates very low, Operation Twist involved selling short- and medium-term bonds and using the proceeds to buy long-term bonds. Given the Fed's ability to influence short-term rates, the Fed was not worried that this policy would raise short-term interest rates. Overall, the Fed replaced about $660 billion in short-term securities with an equal amount of long-term securities (Sommer 2012). Operation Twist was extended

[13] "Recent Federal Reserve Monetary Policy," Steve Meyer, Uploaded January 19, 2011. URL as of April 15, 2013: http://www.youtube.com/watch?v=0PmXbTcOVhU

through the end of 2012. Also in late 2012, the Fed announced an additional round of quantitative easing, known as "QE3". The Fed will purchase $40 billion of agency mortgage-backed securities per month while continuing to use principal payments received for maturing securities to buy new securities. In total, the Fed will add $85 billion in long-term securities to its balance sheet each month (Federal Reserve Press Release, Sept. 13, 2012).

In implementing each of these policies, banks have played a fundamental role. First of all, banks hold a variety of different securities and create markets for them. Secondly, the payments and lending functions they perform enable the Fed to buy securities. When the Fed purchases securities, it credits reserves to the seller's bank. The bank then transfers these funds to the security seller who then decides how to use the funds. If the seller decides to withdraw the funds, they will eventually wind up back in the banking system at another bank. If the seller leaves the funds at the bank, the bank will either lend these funds to borrowers or keep them as reserves. Given the overall level of loans and reserves in today's financial system, it is safe to say that much of the proceeds from the securities sold to the Fed have remained as banking reserves.

Through the use of open market operations, the discount window, reserve requirements, and quantitative easing, banks help the Fed conduct monetary policy. In the end, the Fed's main goals behind an effective monetary policy are to provide the economy with price stability and high employment. As the financial system has become more complex, the Fed has also taken on a new role – promoting financial stability. This expanded role delves back into the TBTF discussion and is an important part of the debate about the role of financial institutions,

specifically large banks versus small banks, in the lives of individuals, businesses, and the economy as a whole.

III. Analysis of U.S. Banking Institutions: Big and Small

Bank Balance Sheet Analysis

To analyze how activities differ by bank size, I have separated all U.S. commercial banks into four categories: largest (total assets over $10 billion); large (total assets over $1 billion, but less than $10 billion); small (assets over $100 million, but less than $1 billion); and very small (assets less than $100 million). In order to look at differences across different sized institutions, I obtained balance sheet data from the FDIC, (measured both in dollars and percent of total assets) as of September 30, 2012.[14] Tables 3 and 4 summarize the main differences on the asset and liabilities and equity sides of the balance sheet, respectively.

Starting with the asset side of the balance sheet (Table 3), the first major area of difference is in securities held. Very small banks hold 24.90% of their assets in securities while the largest banks hold 20.29%. Furthermore, the composition of the securities held varies significantly. The differences in securities held are shown in Table 5. For example, banks with less than $10 billion in assets held significantly more U.S. government securities than banks with more than $10 billion in assets. The largest banks held about 3% less of their assets in U.S. government securities than did banks in the other three categories. Since U.S. government securities are considered to be the safest type of security by the market, they require the least analysis, but also carry the lowest yields. The data suggests that smaller banks concentrate on

[14] The balance sheet data comes from the FDIC's Statistics on Depository Institutions database at http://www2.fdic.gov/sdi/index.asp

simpler and less-risky investments. This may be because smaller institutions lack the economies of scale that larger institutions have. The lack of economies of scale reflect in the smaller institutions' choice of securities because the economics of their operations may not have the capacity to hire employees with the specialized analytical skills necessary to purchase more complex securities like MBS, foreign, or structured securities. Increased risk-taking on the asset side of their balance sheets by large banks is further evidenced by the largest banks' almost exclusive (among the bank groups) holding of foreign debt securities, structured financial products, and asset-backed securities (excluding residential and commercial MBS). These securities (included in the "Other" category of Table 5) make up 2.61%, 0.43%, and 1.31%, respectively, of the largest banks' assets, compared with negligible amounts for all other bank groups.

The percent of assets held as state and local government securities also differs between the different bank groups. Industry-wide, state and local government securities are relatively insignificant in that they comprise 1.84% of all banking assets. However, many of the banks in two smallest banking groups hold a substantial portion of their assets as state and local government securities. The fact that smaller institutions hold a larger percentage of their assets in local government securities shows the importance of these institutions to their local communities. At the same time, the sheer size of the larger banks means that the largest banks as a whole hold a majority of the outstanding bank-held municipal debt. By investing in local debt securities, institutions can show people in a specific geographic area their commitment to that area. Recently, another reason small banks have been holding a large number of local

government securities, such as municipals, is that it is challenging for banks to make profitable loans in today's economic environment (Terris 2013).

Returning to Table 3, a second major difference in asset allocation across different sized banks is seen in the levels and mix of loans held on the balance sheet. Overall, net loans and leases are the largest single asset class, making up over 50% of commercial bank assets. The two midsized bank groups hold close to 60% of their assets in loans and leases while the largest banks hold less than 50% of their assets as loans and leases. The very small banks hold about 55% of assets as loans.

Bank net loans and leases are detailed in Table 6. The mix of loans and leases held by the different bank groups provides insights about the types of business they are involved in. Real estate loans make up a little over half of net loans and leases held by all banks and account for more than a quarter of all assets. Residential mortgages on 1-4 family homes comprise the largest single category of real estate loans. Almost all of the different sized banks hold about 15-16% of their assets as 1-4 family residential loans. Much of the variation across the bank groups comes from construction/land development and commercial real estate loans. In both instances, the three smallest bank categories hold the highest amount of these loans as a percent of their assets. These loans tend to require intensive local knowledge, providing smaller banks a competitive advantage. The very small banks hold a smaller percent of loans than the two middle sized categories – most likely because their small size limits the size of their loans and these banks may lack the expertise to be involved in these markets. Nevertheless, the

smallest banks still allocate a larger share of their assets to these loans than do the largest banks.

Commercial and industrial (C&I) loans made up 10.72% of bank assets and 20.77% of all loans. C&I loans are made to businesses to finance and expand their operations. These loans make up a greater percent of assets at larger institutions (10.84%) than at smaller institutions (7.68%). Generally, C&I loans (especially larger loans) require more expertise to underwrite than other types of loans and the business applying for the loan must be evaluated and monitored by bank personnel. Since businesses have more complex finances and are more geographically distributed than individuals, business lending requires more specialized analytical talent. As evaluating businesses for a loan can be difficult, C&I loans carry a higher risk, and therefore, a higher return.

Loans to individuals made up 9.23% of bank assets. As with C&I loans, these loans make up a greater percent of assets at the larger institutions. The differences in loans made to individuals come mostly from credit cards and auto loans. In each category, the larger institutions hold a much larger percent of their assets in these loans. Economies of scale make it more profitable for the largest institutions to be more involved in loans to individuals – especially credit card lending. A significant cost to making these loans is the servicing cost. As a result, while many small banks may issue credit cards, they often do so in partnership with a larger bank that makes the credit advances and services the cards for the smaller bank.

Farm loans make up an insignificant fraction of industry assets (0.48%), but are heavily concentrated in the two smaller groups of banks. These loans make up 6.63% (of under $100m)

and 2.52% (of over $100M and less than $1B) of smaller banks' assets. This category again reinforces the view that smaller banks tend to engage in locally targeted lending activities, usually serving a particular group of local individuals or businesses. Finally, total other loans and leases made up 5.07% of bank assets. The concentration of the "other" loans and leases category in the largest banks shows the wide range of activities of larger institutions and their ability to analyze special securities.

Table 3 also shows that trading accounts exhibit significant variation across different groups of banks. Almost all trading account assets are held by the largest group of banks, demonstrating the complexity of services provided relative to the other groups of banks. Since trading activity entails significant risk and costly expertise, it is another activity that benefits from a big banks' large scale of operations.

The remainder of bank assets are split between cash, interest-bearing balances, Fed Funds Sold and reverse repo, goodwill, bank premises and fixed assets, and all other assets. The differing levels in these assets are not as significant as the differences in securities and net loans and leases in comparing the banks. However, it is worth noting that only the largest two categories of banks have meaningful goodwill. This asset is generally the result of merger and acquisition activity, which is concentrated in the large bank groups.

Table 4 reports data describing the liability structure of the various bank groups as of September 30, 2012. Liabilities represent 88.52% of assets, leaving about 11% equity. At this level of aggregation, there is little difference across the bank groups in late 2012. Within the liabilities, smaller banks rely more on deposits and the larger banks utilize a wider range of

liabilities. However, this has not always been the case. Only in the past decade have the largest banks shifted away from deposits to rely on other short-term funding such as repo. Within deposits, the types of deposits vary significantly by bank group.

Deposits as a whole range from 85% of assets for the smallest banks to less than 59% for the largest banks, with an industry average of about 63% of assets. A more detailed breakdown of deposits is shown in Table 7. One major difference between the types of deposits held by each group of banks are transaction accounts. Smaller banks hold transaction accounts equal to 28.63% of assets while the largest banks hold transaction accounts equal to 8.73% of assets. Transaction accounts (e.g., checking accounts) are important to developing deeper relationships with individual customers. Smaller banks are more likely to focus on developing these relationships and, therefore, make greater use of transaction accounts than larger banks. As mentioned earlier, transaction accounts give a bank's customers access to a payments mechanism. Smaller banks also have consumer time deposits that make up a much greater percentage of assets for small banks than larger banks. Larger banks make greater use of deposits held in foreign offices, brokered deposits[15], and MMDAs[16] than do smaller banks.

The other main differences in the types of liabilities shown in Table 4 include the amount of federal funds purchased and repos, trading liabilities, other borrowed funds, subordinated debt, and all other liabilities. In general, transaction accounts and CDs are a much more stable source of funding than repos and federal funds. Additionally, these stable funding

[15] A large-denomination bank deposit that is sold by a bank to a brokerage, which then divides it into smaller pieces for sale to its customers

[16] Money Market Deposit Accounts (MMDAs) are shown in the nontransaction category because these accounts have transaction limits (i.e., a limited number of checks can be written per month)

sources require less managerial expertise and little hedging. The opposite is true for repos and fed funds, which require greater expertise and more hedging. The common thread between each of these liabilities is that the biggest banks use these sources of funding more often than do smaller banks. This supports the argument that bigger banks have more complex operations and open themselves up to different risks than do the smaller banks, which almost exclusively rely on stable deposits.

Decomposition of Bank Profitability

Methodology

The methodology behind our bank profitability analysis follows that first used on a firm-wide basis by DuPont Co. Profitability decomposition can also be used to make comparisons on an industry-wide basis (Bodie, Kane, and Marcus 2010). For example, Standard & Poor's used this method to compare profitability of Canadian and U.S. banks from 2000 to 2011.[17] This section uses that methodology to look at the differences in profitability between the largest, medium, and smallest sized U.S. banks (measured by asset size) from 1992 to 2012.

Data from the FDIC's Statistics on Depository Institutions (SDI) database[18] was downloaded to examine the differences between the profitability of the bank groups. Data collection involved downloading annual data from each reporting bank and then aggregating the data for each group of banks[19] from 1992 through 2012.[20] Specific types of data

[17] Standard & Poor's, "A Tale of Two Countries: U.S. and Canadian Banks's Contrasting Profitability Dynamics". November 13, 2012.
http://www.standardandpoors.com/ratings/articles/en/us/?articleType=HTML&assetID=1245343976319
[18] FDIC SDI website: http://www2.fdic.gov/sdi/index.asp
[19] The focus of this section will be on the profitability of commercial banks, excluding savings banks and thrifts.
[20] Balance sheet data for 2012 is as of September 30, 2012 and operating results were annualized based on the first three quarters. Final data for 2012 was not available at the time of this analysis, which could unduly influence

downloaded include assets and liabilities, income and expenses, and performance and condition ratios. The data downloaded with variable descriptions are shown in Table 8. After downloading this data, statistical software was used to append and merge the collected data to make it more usable for analysis. Next, the individual variables contained in each of the merged data were labeled.

In order to proceed with the profitability decomposition procedure, additional variables needed to be generated using the downloaded FDIC data. Generating these variables involved converting the raw FDIC data from dollar amounts into data as a percent of average assets, enabling comparison of variables across banks of different sizes. Upon examination of the initial summary statistics, there were a number of outliers that were distorting the averages. Therefore, a filter was applied to screen out the highest and lowest one percent of values.[21]

This section focuses on two measures of profitability: return on equity (ROE) and return on assets (ROA). Following the DuPont methodology, ROE can be broken down into the product of three factors: asset utilization (revenue/average assets), pretax operating margin (pretax net income/revenues), and leverage (average assets/equity). Each of these components is multiplied together to obtain pretax ROE (see Equation (1) below). The decomposition of ROE into these pieces helps to better analyze profitability because an overall change in pretax ROE could be the result of a number of different factors. For example, a bank's profitability could

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the analysis. For example, the records for some banks on the verge of failure reported negative equity or other unusable values.

[21] Filters (as a percent of assets): Net Interest Margin < 1.25 & > 7.58; Average Earning Assets < 0.79 & >0.97; Non-Interest Income< 0.00 & >8.61; Operating Expense < 1.16 & > 11.00; LOANS (Ratio of average loans to average assets) < 0.15 & > 0.90; CREDIT (based on provision for loan losses and average assets) < -0.25 & > 3.47; Securities Gains and Losses < -0.29 & > 0.47; Extraordinary Items < -0.01 & > 0.19. We believe that these filters primarily exclude special circumstances without distorting the overall description.

increase because it generates more revenue (interest income and fees) or because of an increase in leverage. By decomposing ROE, changes in the individual components can be analyzed so that changes in ROE can be understood as changes in each of these components. Equation (1) shows the ROE decomposition.

$$Pretax\ ROE = Asset\ Utilization * Operating\ Margin * Leverage\ Ratio \quad (1)$$

$$= \left(\frac{Revenue}{Average\ Assets}\right) * \left(\frac{Pretax\ Net\ Income}{Revenue}\right) * \left(\frac{Average\ Assets}{Equity}\right)$$

$$Pretax\ ROE = \frac{Pretax\ Net\ Income}{Equity}$$

Next, this section analyzes the drivers of profitability by decomposing the return on assets (ROA) into several pieces: the profit earned from lending operations (net interest margin), the profit earned from providing services for fees (non-interest income), operating expenses, and credit risk costs.

The decomposition of ROA begins with net interest margin[22], which is multiplied by average earning assets as a percent of average total assets to find net interest income as a percent of average assets. Net interest income as a percent of average assets is then added to non-interest income as a percent of average assets to obtain total operating revenues as a percent of average assets. Finally, operating expenses and credit costs (both as a percent of average assets) are subtracted from operating revenues to get pretax income as a percent of average assets. As in the ROE decomposition, breaking ROA into its components allows for a

[22] Defined as the difference between what an institution earns on the loans and securities it holds and what interest it pays to fund those assets, divided by average assets

better understanding of why ROA as a whole is changing. Equation (2) shows the equation for ROA.

$$Pretax\ ROA = \left(Net\ Interest\ Margin * \left(\frac{Average\ Earning\ Assets}{Average\ Assets}\right)\right) \quad (2)$$

$$+\left(\frac{Non - Interest\ Income}{Average\ Assets}\right) - \left(\frac{Operating\ Expenses}{Average\ Assets}\right) - \left(\frac{Credit\ Costs}{Average\ Assets}\right)$$

Major Results from Bank Profitability Analysis

Tables 10 and 11 summarize pretax ROE and ROA and their components, averaged over the full time period, for each of the groups. Figures 4 and 5 show how profitability measures change over time for each group. The profitability data show one main theme: The largest banks have experienced higher ROE and ROA from 1992 to 2012.

Looking at Figures 4 and 5 shows that ROA is both less volatile over time and more uniform across bank groups than ROE. ROA was generally stable until the mid-2000s and then fell sharply during the financial crisis. Although all three bank groups had similar ROA in 1992 (ranging from 1.10% for the largest to 1.41% for the smallest), ROA gradually rose over the next several years with the smaller banks lagging. For the second half of the 1990s, the medium and largest banks had similar ROAs (increasing slightly throughout the decade and peaking in the late 1990s at about 2% in 1999). After the late 1990s, ROA for the large and medium banks plateaued around 1.75% for several years before returning to approximately 2% just prior to the crisis. At the same time, the smaller banks' ROA averaged about 1.5%. During the financial crisis, ROA for all three groups declined precipitously to a low of 0.27% for each group in 2009.

Since the end of the financial crisis, ROA for the medium and largest banks has rebounded to about 1.2%, but smaller banks have again lagged the larger banks and ended 2012 at 0.93%.

One reason large and small bank ROAs have taken such different paths over the past twenty years is the fact that the mix of assets and types of activities differ greatly between different sized banks. Generally, smaller banks rely less on non-interest income than larger banks. Fee income is more volatile on a year-to-year basis than interest income and this greater volatility is reflected in the changes in ROA. After the financial crisis and subsequent regulatory change, it became more difficult for all banks to earn as much non-interest income as they historically had. Because non-interest income is more important to large banks, this change affected the largest banks more than the smallest banks. Additionally, today's low interest rate environment has narrowed the spread between what lenders earn on loans and securities and what lenders pay on their liabilities. The spread earned is a major driver of banks' interest income. As will be shown subsequently, smaller banks generally invest more conservatively and typically earned a narrower, more stable spread. Larger banks have typically invested more aggressively in riskier, higher-spread loans and securities, and have made greater use of short-term funding reserves (e.g. repos). The narrowing of spreads post-financial crisis has affected larger banks more than the small banks. Therefore, both non-interest income and net interest margin have contributed to the recent convergence of ROAs across groups. The ROA decomposition provided below examines these trends more closely.

Figure 5 shows ROE by bank group from 1992 to 2012. From 1992 to 2012, the large banks' pretax ROE[23] is the highest of the three groups, followed by medium sized banks, and then the smallest banks. Beginning in 1992, ROE for the two larger groups of banks generally increased (from about 17% for each group), peaked in 1999-2000 (at 36% for the largest banks and 26% for medium sized banks). For the smallest banks, ROE started lower at 14.8% in 1992. ROE for the smallest banks peaked at 17.2% in 1996. After 2000, ROE for the two largest groups declined, plateauing in the mid-2000s at about 30% for the largest banks and about 22% for the medium banks. The smallest banks' ROE stayed relatively flat (between 14% and 17%) from 1997 through 2006. During the financial crisis, ROEs for the two larger groups of banks bottomed out in 2009 at 4.4% and 2.3%, respectively. Medium sized bank ROE declined below the smallest banks' ROE during the financial crisis. The smallest banks' ROE bottomed at about 2.5% in 2009. Post-financial crisis, all of the bank groups' ROE has rebounded, with the general historic pattern (largest, medium, and smallest) reoccurring.

The next section examines the drivers of ROA and ROE for each of the groups of banks, to explain the fundamental differences in how different sized banks operate and generate profit.

Examination of ROA Components

As shown in Equation (2), the first component of ROA is net interest income as a percent of assets, determined by two subcomponents: a bank's net interest margin and the ratio of its average earning assets to average assets. Net interest margin is defined as the difference between interest income and interest expense divided by earning assets. It is a measure of a

[23] ROE mentioned in this paper is pretax ROE.

bank's profitability from lending operations. The ratio of average earning assets to assets is a measure of how efficiently a bank is allocating its capital. For example, a bank with excessive plant and equipment or above average non-earning assets (e.g., as a result of defaulted loans) will have a lower ratio. The following section will first examine net interest income, and then discuss net interest income's two subcomponents, net interest margin and average earning assets to average assets.

Figure 6, shows net interest income as a percent of assets. The figure shows an overall downward trend for all three groups. Net interest income is one of the few areas in which smaller banks have historically had an advantage over the larger two groups of banks. Regression analysis with net interest income as the independent variable and ROA as the dependent variable shows that for all banks, net interest income explains about 18.3 percent of the variation in ROA. Across the different bank groups, the analysis show that net interest income explains differing levels of ROA. For the largest banks, net interest income only explains about 13.6% of ROA, while it explains about 22.0% and 18.9% for the medium and smallest banks respectively. This analysis shows the greater importance of net interest income to smaller banks.

The increased importance of net interest income to smaller banks comes as a result of the smaller banks holding an advantage in the two subcomponents of net interest income, the ratio of average earning assets to average assets and net interest margin. Figure 7 shows that the smallest banks have had the highest ratio of earning assets to assets and that this ratio has remained relatively stable for each of the three groups over time. Figure 8 shows net interest

margin (the difference between interest income and interest expense divided by earning assets) over time. Although there is a clear downward trend in net interest margin, the relative ranking of the three groups has been stable – even during the financial crisis. The decline in net interest margin could come from two main sources: a change in the composition of assets and liabilities held or from the secular downward trend in interest rates – and narrowing of spreads.

The differences between the balance sheets of larger and smaller institutions confirm the latter's advantage. Smaller institutions hold a larger percentage of their assets in interest earning assets such as loans and securities; larger institutions hold a larger percentage of their assets in non-earning assets such as goodwill and other intangibles.[24] On the liabilities and equity side, smaller banks have a greater amount of deposits as a percent of assets. While this effect on its own could decrease net interest margin, smaller banks hold a very large amount of their deposits in transaction accounts. Since banks pay very little or no interest on transaction accounts, having a large amount of transaction accounts permits smaller banks to reduce their interest expense, raising net interest margin.

Looking at the balance sheet composition for each of the groups from 1992 and 2012 shows that very little of the decline in net interest margin came from changing balance sheet composition. The percent of assets smaller banks held as loans and securities did not change much from 1992 through 2012 (about 83% of assets for both years). Over the same time period, larger banks did see a slight shift downward in the percentage of their assets held as loans and securities from 72 to 70%. On the liabilities and equity side of the balance sheet, some changes

[24] Goodwill is generally the result of mergers and acquisitions and reflects the excess purchase price over the market value of the company being acquired. Larger banks tend to be more active in mergers and acquisitions, and generally have more goodwill as a percent of assets.

have also occurred. For one, in 1992, commercial banks as a whole had liabilities equal to 92.5% of assets (implying equity of 7.5%); by 2012, liabilities had fallen to 88.5% of assets (with equity equal to 11.5% of capital). All else equal, this shift to greater equity funding would increase net interest margin. Within liabilities, the overall amount of interest-bearing deposits has declined slightly from 1992 to 2012, which would also lead to an increase in net interest margin. The combination of these two effects suggests higher net interest margin, all else equal. However, as detailed above, net interest margin has declined. Therefore, the decline must have occurred because of the decline in interest rates and the narrowing of spreads.

Figure 9 shows the shape of the U.S. Treasury Yield Curve in 1992 and 2012. Given the drastic change in interest rates from the early 1990s through 2012, it is not surprising that interest rates would have a larger effect than balance sheet composition on the change in net interest margin over time. Other than showing how much rates have fallen since 1992, Figure 9 also shows how the yield curve has flattened since then. The shape and steepness of the yield curve is very important to banks' net interest margin. From 1992 through 2012, the difference between the 30-year and 3-month U.S. Treasury rates has changed from 3.5% to 3.0%, respectively. Generally, a flattening of the yield curve has the effect of squeezing net interest margin. In addition, spreads for risk have tended to decline.

The second revenue component of the ROA decomposition (Equation (2)) is non-interest income. Non-interest income is generated when banks earn fees for specific services such as advisory and placement, trust departments, and account-related services. Figure 10 shows non-interest income as a percent of assets over time. Given the different business models of small

and large banks, it is not surprising that large banks generate more non-interest income than small banks. While this relationship has held from 1992 through 2012, smaller banks' today do not face as great of a disadvantage as they did in 1992. While all banks have seen the amount of non-interest income generated fall from 1992 to 2012, the largest banks have seen the greatest decline. Non-interest income has fallen 34%, 26%, and 10% for the largest, medium, and smallest banks over that period of time, respectively. Even in the run up to the financial crisis, banks relied less on non-interest income than they did in the early and mid-1990s. The reasons for the decline in non-interest income include the growing competitiveness of financial intermediation discussed at the beginning of Section II, the slow growth economic environment of 2009 - 2012, and regulatory changes (caps on bank fees) in response to the financial crisis.

Bringing together net interest income and non-interest income gives total operating revenues to average assets. Total operating revenues show that the smallest banks' advantage in interest income is not large enough to offset their disadvantage in non-interest income. Figure 11 shows that from 1992 through 2012, the smallest banks' total operating revenues have lagged those of both larger bank groups. Given the downward trend in interest and non-interest income, total operating revenues as a percent of assets has also declined for all three groups; the trend for each group has been similar.

The final part of the ROA decomposition is to look at operating expenses and credit costs shown in Figures 12 and 13, respectively. For much of the 2000s, the two largest groups of banks were able to achieve certain economies of scale, and better limit operating expenses than the smallest banks. Historically, this has not always been the case. In the early 1990s,

smaller banks had lower operating expenses than larger banks. Their lower operating costs were most likely a result of providing fewer services and being less involved in market sectors that require highly-skilled employees (e.g. derivatives trading, swaps, and complex securities). This pattern changed in the late 1990s as larger banks grew rapidly and lowered their operating expenses as a percent of assets in part through merger activity and the resulting consolidation of branches and poor-performing offices. At the same time, the smallest banks' operating expenses stayed relatively stable. This suggests that the large banks were able to achieve cost savings and efficiencies from their growth. The two largest groups of banks saw a reversal of the downward trend in operating expenses during the financial crisis. A positive sign for the smallest banks is that the gap between their operating expenses and those of the larger banks is the smallest it has been since the larger banks became more efficient in the late-1990s.

Credit costs are equal to the provision for loss as a percent of assets. This provision for loss is a noisy indicator of the costs for defaulting loans and securities. Historically, the larger banks have had higher credit costs than the small banks, most likely as a result of the higher-risk lending these institutions engage in as discussed earlier.

To complete the ROA decomposition, operating expenses and credit costs are subtracted from total operating revenue. The overall result shows that the larger banks are more profitable than smaller banks as measured by ROA. To summarize, the smallest banks begin with an advantage in net interest margin. They also have a larger ratio of earning assets to assets. The product of these two variables, net interest income, is higher for the smallest banks than the other two groups. This advantage disappears after non-interest income is

accounted for as the large banks generate more non-interest income. The position of the smallest banks is further eroded by the fact that they have higher operating expenses than the larger banks. The end result is that the smallest banks' profitability as measured by ROA lags behind that of the two larger groups of banks.

Examination of ROE Components

As shown in Equation (3) below, return on equity is closely related to return on assets.

$$ROE = ROA * \left[\frac{Assets}{Equity}\right] = ROA * Leverage \quad (3)$$

However, the decomposition of ROE used in Equation (1) adds a different perspective on ROA. Equation (1) breaks ROA into two pieces: (1) Revenue divided by assets and (2) pretax net income divided by revenue. The first component measures a bank's revenue-generating capacity – much as sales measures revenue for a traditional manufacturing firm. The second component measures a bank's ability to convert revenue into profit. This section discusses this alternative perspective and decomposition of a bank's ROE. Equation (1) is repeated here for convenience.

$$Pretax\ ROE = (Asset\ Utilization) * (Operating\ Margin) * (Leverage) \quad (1)$$

Figure 14 shows asset utilization (revenue divided by average assets) by bank group from 1992 to 2012. The figure shows that all three groups have experienced a slight decline from 1992 to 2012. An analysis of the variance shows that changes in asset utilization explain about 12.5% of the variation in ROE. Asset utilization explaining a small amount of the variation in ROE makes sense because asset utilization has remained relatively stable compared to ROE

(Figure 5) from 1992 to 2012. Over that time period, all three groups have had similar levels of asset utilization (between 4%-6%). Revenue is the sum of net interest income and non-interest income as described in the ROA decomposition above. That analysis concluded that bank revenue declined over the 1990s and 2000s because of decreasing net interest margins. Similarly, asset utilization has also declined.

Figure 15 shows operating margin (pretax net income divided by revenue) over time for each group of banks. The figure exhibits much greater volatility in operating margin than asset utilization. The two largest groups of banks' operating margin each followed a similar path from 1992 to 2012. Beginning in 1992, operating margin was 19.7% for the largest banks and 22.3% for medium sized banks. Operating margin for each group increased steadily after this, peaking at 40.8% for the largest banks and at 39.4% for medium sized banks in 2005. This high level for operating margin meant that these two groups of larger banks were able to convert forty cents of every dollar of revenue into pretax profit. After 2005, operating margin for each group began to fall slowly at first, before plunging to a low of 1.8% for the largest banks and 2.0% for medium sized banks in 2009. Contributing to this sharp decline in profitability was a sharp increase in loss provisions attributable to bad loans and the broad deleveraging in the economy. Since the financial crisis, operating margin for the two groups has recovered to approximately 25% for each group. Operating margin for the smallest banks followed a somewhat different path than the other two groups. Although generally increasing from 1992-1997, during the mid-1990s, however, the smallest banks' operating margin declined to less than 25% – well below that of the other two groups. While the two largest banks saw their operating margins increase by about 6% from 1997 to 2005, operating margin for the smallest

banks slowly declined 3% over the same time. However, the smallest banks' operating margin fared better during the financial crisis (largely due to the more conservative asset allocation discussed earlier), narrowing the gap. By 2010, the earlier relative relationship had returned with the smallest banks' operating margin being below that of the two larger groups. Overall, operating margin explains about 68.1% of the variation in ROE and is, therefore, the most significant factor in determining bank profitability as defined by ROE.

Figure 16 shows the leverage ratio (average assets by tangible common equity) for each of the bank groups over time. Although changes in leverage only explain 6.9% of the variation in ROE, it is interesting to compare leverage because it can be viewed as a proxy for much of a bank's risk. Major differences in the leverage ratio exist between the groups of banks, with the largest banks having the highest leverage and the smallest banks having the lowest leverage. For much of the period, leverage of the largest banks fluctuated around 16. Deleveraging in response to the financial crisis and the Dodd-Frank reforms has led to a dramatic downward shift in leverage at the largest banks. In September 2012, it was 12. Over this same period, leverage at smaller banks has remained stable – fluctuating between 10 and 12. As of September 30, 2012 the difference in leverage across the three groups is the smallest it has been in the past twenty years. Given the current regulatory environment and increased focus on limiting the risk of the large financial institutions, it is likely that this difference will remain small with all banks maintaining equity of about 8-10%. This is a positive sign for the competitiveness of the smallest banks in the future.

Conclusions and Outlook about Bank Profitability

From 1992 through 2012, larger banks have been more profitable than smaller banks on the basis of both ROA and ROE. For ROA, the gap in profitability has largely been driven by the different types of banking each engages in. Each group of banks engages in "traditional" banking including taking deposits to fund loans and providing services for fees. The smaller banks have been more profitable in their lending activities because they fund more of their loans with low cost deposits. At the same time, larger banks have been more successful at generating fee and other non-interest income. In addition, larger banks have been able to capture some efficiencies of scale in their operations, which has resulted in lower operating expenses as a percent of assets.

Looking solely at overall historical profitability paints a challenging picture for the smaller institutions. Nevertheless, there are reasons to be optimistic about the future prospects of smaller banks. For one, as I discussed in the "Examination of ROA Components" and the "Functions of Financial Intermediaries" sections above, the nature of financial intermediation has been changing into a more complex and fractionalized system. This suggests that there will continue to be opportunities for banks that focus on generating interest income based on local lending.

At the same time, firms that provide advisement and placement services could see increased competition in response to a shortage of deals and activity and the greater direct access of corporations to the market. To this point in the financial crisis recovery, the economy has not seen the sustained, strong growth that might cause a number of large companies to

seek out the services of an investment bank tied to one of the large institutions. These challenges may make it harder to earn non-interest income – something that will affect large banks more than small banks. Another reason non-interest income might not be as high going forward is due to changes in the regulatory environment in response to the financial crisis. As part of Dodd-Frank, caps were placed on certain types of bank fees. Furthermore, the creation of the Consumer Financial Protection Bureau could mean banks face more challenges with consumer fees. With the potential to increase non-interest income limited, banks will have to rely more on improving their net interest income, an area where smaller banks have held an advantage.

Smaller banks should also be optimistic because once again their operating expenses as a percent of assets are more in line with those of larger banks. While smaller banks must continue to control their costs, they are being helped by regulatory change. The debate about what regulations will apply to which institutions is still ongoing, but among regulators, there appears to be support for the view that the more stringent regulations should apply only to the largest institutions. This would benefit the smaller banks as they would have lower compliance costs than the larger banks.

A final bright spot for smaller banks is that leverage for the larger banks has fallen significantly since the financial crisis and it is likely that new regulations will prevent a return to the previous levels. In general, smaller banks have had leverage of about ten for the last twenty years; larger banks now have average leverage of about eleven. This is a significant shift because pre-financial crisis, the largest banks had almost twice the leverage of smaller banks.

The outlook is positive for smaller banks because banking regulators want to see large banks hold more capital, reducing leverage and risk. Since it is unlikely that regulators will allow large banks to increase leverage to the previous levels, one of their traditional advantages over smaller banks is diminished. If leverage remains roughly equal among the three groups, the variation in ROE between the groups should decline. I will discuss changes in capital regulation in more detail in Section IV.

IV. Current Issues in Banking

Changes to the banking industry and current issues in banking are being driven by two main forces: the response to the financial crisis and the secular trend of changes in industry structure. The response to the financial crisis has two important factors: the slow economic recovery and the imposition of new regulations intended to prevent a recurrence. The second major force includes the long term changes in the roles and types of financial intermediaries. Banks continue to face increased competition from nontraditional lenders post-crisis. This section will first give a broad overview of specific regulatory changes and new legislation as it pertains to U.S. banks. The section also discusses bank stress testing, bank capital, and the newly created Consumer Financial Protection Bureau (CFPB). The section ends with discussion about several interesting questions facing the banking industry going forward.

Overview of Regulatory Changes in Response to the Crisis

As widely reported, governments and regulators have created new regulations in response to the global financial crisis. Many of these regulations aim to better manage global financial risks by reducing the severity and the probability of there being a future large scale

financial panic. Given the complex and interconnected nature of the modern financial system, these new regulations have been designed on both an international and country-by-country scale.

Internationally, these efforts have centered on updating the Basel II rules into new rules referred to as Basel III. While some could question the logic of rolling out a new regulatory framework when Basel II had yet to be fully implemented, Basel III shifts the focus of regulators from firm-level or micro-risk to system-wide or macro-level risk. Having a regulatory emphasis on systemic risk makes sense in light of the financial crisis because regulators, banking firms, and the public did not realize how interconnected the global financial system had grown before the crisis. Additionally, addressing liquidity concerns should increase the safety-and-soundness of the financial system by placing greater emphasis on meeting short-term financing needs – a source of significant failure in the recent financial crisis.

Retaining the same base eight percent minimum capital ratio required under Basel II, Basel III slowly increases the amount of Tier 1 common equity that banks are required to hold. In addition to the eight percent base capital requirement, Basel III provides for other capital buffers including a countercyclical buffer (to be used at the discretion of regulators) and a capital conservation buffer. The Bank of International Settlements, which has written the Basel framework, has put out a timeline for adopting the new minimum capital standards. The BIS' timeline calls for minimum total capital plus the additional buffers to remain at eight percent until 2016. In 2016, the capital conservation and countercyclical buffers are scheduled to take effect. By 2019 Basel III is supposed to be fully implemented and, if regulators were to require

full use of the countercyclical buffer at that time, total bank capital requirements would equal 10.5 percent (Ennis and Price 2011, 1-2). The capital conservation buffer is designed to force banks to hold additional capital to absorb losses during downturns, so that access to short-term credit markets can be preserved (Dudley 2010). The countercyclical buffer is designed to mitigate "the issue of pro-cyclicality in financial markets regulation" (Repullo and Saurina 2011). The general idea behind the countercyclical buffer is to have banks save excess resources during good times in order to draw upon these accumulated resources as they experience losses (G20 Progress Report 2009).

In addition to increasing the amount of capital that banks hold, Basel III also introduces several other risk management requirements including a more broadly defined leverage ratio and a liquidity coverage ratio. The leverage ratio is computed by taking total Tier 1 capital and dividing it by "total exposure". Total exposure is defined as "the sum of the exposure values of all assets and off-balance sheet items not deducted from Tier 1 capital." The inclusion of off-balance sheet items is an important extension. Acceptable levels of leverage are expected to be above three percent. The BIS' guidelines state that regulators should require banks to report this ratio on a trial basis until 2018 when it should become binding (Accenture Basel III Handbook, 32). The liquidity coverage ratio (LCR) seeks to "improve short-term resilience of the liquidity risk profile of institutions, requiring them to hold a buffer of 'high-quality' liquid assets to match net liquidity outflows during a 30-day period of stress" (Accenture Basel III Handbook, 36). The LCR computation takes the value of high-quality liquid assets and divides that by total net liquidity outflows over a 30-day stress scenario. This ratio must be greater than 100 percent. The BIS is seeking for this ratio to become binding by 2015 (Accenture Basel III

Handbook, 37). A final measure Basel III seeks to implement is the "Net Stable Funding Ratio", which "requires institutions to maintain a sound funding structure over one year in an extended firm-specific stress scenario." This ratio is defined as "available stable funding" divided by "required stable funding" and must be greater than 100 percent. The BIS' guidelines for this rule call for binding adoption by 2018 (Accenture Basel III Handbook, 42-3). The inclusion of the leverage, liquidity, and stable funding ratios is likely to limit the use of leverage by larger banks and the use of volatile funding in place of deposits.

An important note about the BIS and Basel regulations as a whole is that the BIS does not actually possess any rulemaking or other authority in the international arena. It simply issues guidelines on global financial regulation, leaving the Committee member nations in charge of implementing the rules in their own countries. As such, how many of the guidelines are adopted depends on the political processes of many governments worldwide. A problem with this voluntary international regulation (especially the aspects targeting systemic risk) is that a single country that refuses to adopt the new format could threaten the entire scheme. To this point in time, the Implementation of Basel III has been challenging for regulators and it is unclear when, and if, the new rules will be fully adopted (Bank of International Settlements 2012).[25] Both the United States and the European Union missed the January 1, 2013 deadline for implementing the first round of reforms and are now working towards beginning the process next year (Moshinsky 2013).

For smaller U.S. institutions, there is significant controversy over how the rules will be applied and even whether they should apply to small local banks that pose little, if any,

[25] http://www.bis.org/publ/bcbs215.pdf

systemic risk. Many small institutions feel that because they do not represent a systemic risk, they should not be forced to comply with Basel III. In November 2012 testimony before the House Financial Services Subcommittees, Independent Community Bankers of America Chairman-elect William A. Loving Jr. said, "Basel III was meant to apply only to the very largest, internationally active institutions" and that "community banks, with their simple capital structures and transparent and conservative lending, have little in common with these larger institutions. Applying the same capital rules, in addition to the many other new and far-reaching regulations that are soon becoming effective, will only undermine the viability of thousands of community banks" (Independent Community Bankers Association 2012). In the U.S. as a result of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the Fed has been designated as the main regulator with responsibilities for implementing Basel III and is thus largely in charge of determining which regulations will apply to which institutions. Although final rules have not been written, the Fed has said that only those institutions that are currently subject to the Fed's minimum capital requirements (generally institutions with more than $500 million in assets) will be affected. In response to criticism, the Fed argues that over 80% of community banks would already meet the "full phased-in requirements plus the capital conservation buffer" (Fed Community Banking Connections, Third Quarter 2012).

In addition to implementing Basel III, the U.S. has also passed significant regulatory legislation in response to the financial crisis. The Dodd-Frank Act covers a wide variety of issues and is very broad in scope. For the purposes of this paper, I will discuss the effects of the Act on U.S. banks. The Act as it pertains to banks calls for the creation of a Financial Stability Oversight Council, reduces the amount of regulatory competition among U.S. regulators, limits the

amount of proprietary trading banks can engage in, seeks more oversight of the swaps market, and creates the CFPB.

Title I of the Act deals with financial stability and creates two new offices within the Treasury Department – the Financial Stability Oversight Council and the Office of Financial Research. Together these offices are tasked with identifying risks to U.S. financial stability, promoting market discipline (by eliminating TBTF expectations), and responding to threats that effect financial stability. One advantage that the FSOC has over other regulators is that the board is composed of the heads of all the major financial regulators: the Secretary of the Treasury, the Fed Chairman, the Comptroller of the Currency, the CFPB director, the SEC Chairman, the FDIC Chairman, the CFTC Chairman, and the FHFA director among others (FSOC 2012). The Dodd-Frank Act requires all financial institutions (bank or non-bank) with over $50 billion in assets to submit annual reports to the FSOC detailing the company's financial condition and how the company's activities could have a disruptive financial impact on the country (H.R. 4173 Title I).[26] As of 2012, there were 33 banking financial institutions with over $50 billion in assets. The 2012 FSOC Annual Report mentions the difficulties the financial system still faces in the recovery including euro area stress and a general weak macroeconomic environment. For banks, the FSOC mentions strengthening balance sheets and lower reliance on short-term wholesale financing as positives for risk reduction. The Council explains that these changes are important given the continued problems in the euro zone (FSOC 2012, 3-6). These improvements could be especially beneficial for the health of the banking industry when

[26] The Dodd-Frank Act defines a financial institution as a depository institution, a branch or agency of a foreign bank, a credit union, a broker or dealer, an investment company, an insurance company, an investment adviser, a futures commission merchant, or any company engaged in activities that are financial in nature or incidental to a financial activity.

combined with the declining amount of leverage being used in the industry, especially among larger institutions.

Title VI of the Act created the "Volcker Rule" seeking to prohibit proprietary trading by banks. Given that almost all industry-wide trading account assets are held by banks with over $10 billion in assets, this part of Dodd-Frank aims to reduce the amount of risk the largest firms are taking on, but will also reduce the profits coming from these sources. Since smaller banks do not engage in trading activities, they should not feel the effects of this rule. The rule limits a banking firm from owning more than three percent of a hedge fund or private equity fund and also limits the firm from having more than three percent of its Tier 1 capital invested in proprietary trading activities. Dodd-Frank instructed U.S. regulators to write the rules to implement these ideas (H.R. 4173 Title VI). So far, defining proprietary trading has been difficult for regulators. A main point of difficulty is that banks not only engage in trading on their own behalf, but also on behalf of their clients. For regulators, this has been a difficult distinction to identify and write rules for. As a result, almost three years after the legislation was signed into law, banks are still awaiting regulators' decision (Patterson 2013).

Title VII of Dodd-Frank brought more regulatory oversight to the over the counter swaps market by promoting exchange trading, centralized clearing of swaps, and increasing the transparency of these markets. The CFTC and the SEC are the chief regulators of the swaps market. In conjunction with other banking regulators, the CFTC has proposed margin requirements for banking entities that fit within these regulators' capital requirements. With systemic risk in mind, the CFTC and other regulators are working with international regulatory

groups on international margin standards (FSOC 2012, 106-7). Here too, only the largest banks are active in making a market for swaps – and earning fees from those activities.

Title XVI lays out the responsibilities of the newly created Consumer Financial Protection Bureau (CFPB). In response to the alleged abuses related to mortgage lending and other consumer loans, Title XVI establishes general principles for those involved in lending. One standard the law creates is that mortgage originators must determine a borrower's ability to repay the proposed loan. In addition, originators cannot be paid based on the terms of the loan (especially the loan interest rate), but may still be paid based on the principal amount. Borrowers will have a legal defense in foreclosure proceedings brought by originators who did not identify the borrower's ability to repay or give abusive loan terms. The law created the CFPB to write the specific implementing regulations and, more generally, oversee the relations between financial institutions and consumers. To protect against foreclosure liability, the Act calls for the CFPB to define a "qualified mortgage" (QM). The basic idea behind a QM is that if a lender follows the rules written by the CFPB, the lender can avoid liability in foreclosure proceedings against a delinquent borrower. The CFPB issued the rule in January 2013 with the rule going into effect January 2014 (CFPB). Another area Title XVI touches is that of "high-cost mortgages". A high-cost mortgage is a first mortgage that carries an interest rate greater than 6.5% plus prime or a second mortgage with an interest rate more than 8.5% plus prime. A borrower obtaining a high-cost loan must first sit down with a certified pre-loan counselor (H.R. 4173 Title XVI).

Bank size may play a significant role in determining compliance costs associated with this section of the Act. For a large nationwide bank, it may be difficult to ensure compliance across its national network of correspondents and offices. Given the concentrated geographic nature of their operations (and relatively few number of branches), smaller banks can better deal with compliance than complicated national organizations. At the same time, larger banks may have larger numbers of experienced compliance personnel that may give them a compliance advantage.

Overall, these regulatory changes impose greater costs on larger banks than smaller banks because the regulations are largely aimed at activities undertaken only by the larger institutions. Still, some of the regulations may possibly impose significant costs on smaller banks. For example, Title XVI and the CFPB could have a large impact on lending. Section III of this paper showed how smaller institutions are more focused on local lending activities than larger banks. Therefore, any factor that makes it more difficult or more costly for these institutions to make loans could reduce the amount of lending they do. The end result would be a reduction in bank profitability. While all regulation imposes some costs, regulation also has benefits. In this case, reduced lending activity (the cost) would also mean that only more creditworthy borrowers are able to obtain mortgages (the benefit). The next two subsections will take a closer look at two regulatory developments and discuss the varying implications for large and small banks.

Bank Stress Tests

The general idea of a bank stress test is to predict how well the bank will perform under a hypothetical adverse economic scenario. In general, these scenarios largely test whether a bank has sufficient capital to survive, given its particular loan mix, funding sources, and leverage. It is reasonable to expect that the requirement to pass these stress tests will encourage lower leverage (more capital) and more conservative lending.

In the U.S., the Federal Reserve is in charge of administering stress tests to banks. The Fed conducts two main types of tests, the Comprehensive Capital Analysis and Review (CCAR) and the Dodd-Frank Act (DFA) stress tests. CCAR is done annually and focuses on the largest bank holding companies; DFA stress tests are completed for all bank holding companies (BHCs), savings and loan companies, and state member banks with assets over $10 billion as well as any nonbank financial firms designated by the FSOC as systemically important. In each case, the stress test provides three economic scenarios (baseline, adverse, and severely adverse) described by 26 macroeconomic variables. The goals of the stress tests are to "assess the strength and resilience of financial institutions and their ability to continue to meet the credit needs of households and businesses in stressful economic and financial environments" (Board of Governors of the Federal Reserve System, "Stress Tests and Capital Planning").

In early March 2013, the Fed released stress test results for eighteen large bank holding companies. One of the main findings of the recent stress test was that over the course of a nine quarter event, the 18 BHCs would lose about $462 billion from losses on loan portfolios, losses

on securities, and trading and counterparty losses.[27] Additionally, revenue would be depressed enough that that the eighteen institutions would post pretax net income of -$194 billion (equal to -1.7% of assets). Under these results, the Tier 1 common ratio would fall from 11.1% in the third quarter of 2012 to 7.7% post-stress (Federal Reserve Press Release March 7, 2013).[28]

Based on the results of the individual firms, the Fed is able to approve or object to a firm's capital plan. If the Fed objects to a firm's capital plan, the firm must gain written approval from the Fed in order to make capital distributions. In addition to objecting to a firm's capital plan on the quantitative grounds developed by the stress tests, the Fed can also object on qualitative grounds if the Fed does not agree with the firm's capital planning process. After the March 2013 stress test, the Fed approved the capital plans of 14 firms. Two firms, JP Morgan and Goldman Sachs, are required to submit new capital plans by the end of the third quarter 2013 to address inadequacies in their plans. The Fed objected to the capital plans of two other firms, Ally Financial and BB&T Corporation (Federal Reserve Press Release March 14, 2013).[29]

Clearly, the stress tests impose costs on the larger institutions. In order to take part in the stress tests, these bank holding companies must be able to generate the firm-wide data for the Fed to input into their model.[30] In addition, financial firms must also have personnel with the requisite expertise to design and use the risk models as well as maintain and develop the infrastructure underlying these data-providing systems. Another significant cost to stress testing is the opportunity cost of assigning personnel and other resources to work on the stress

[27] Beginning data was bank balance sheet data as of end of 3rd quarter 2012.
[28] http://www.federalreserve.gov/newsevents/press/bcreg/20130307a.htm
[29] http://www.federalreserve.gov/newsevents/press/bcreg/20130314a.htm
[30] Prudential management of a large institutions should generally require a similar data system.

tests. Some would argue that without stress tests, these resources could be deployed elsewhere in the banks or that credit to consumers could be increased. The bottom line is that stress testing imposes a significant cost on only the largest institutions. Smaller institutions (those with below $10 billion in assets) are exempted from stress tests under Dodd-Frank. In a lot of ways, this exemption makes sense because of the relatively small size of these institutions (if one fails, it will not bring the rest of the economy down with it) and the fact that the efficiencies of scale achieved by larger institutions make them better able to bear these costs.

The Consumer Financial Protection Bureau

The Consumer Financial Protection Bureau (CFPB) was created as part of Dodd-Frank. It's mission is "to make markets for consumer financial products and services work for Americans – whether they are applying for a mortgage, choosing among credit cards, or using any number of other consumer financial products." The motivation behind the Bureau's creation comes in large part from the number of people who were given loans and other financial products that they did not understand in the run up the financial crisis. In many instances, consumers relied on the opinions and representations that financial institution employees made in regards to the types of loans being offered.[31] In many ways, this makes a lot of sense. If someone is working as a loan originator, it is logical for consumers to trust the knowledge of that employee. However, this mechanism broke down as incentives changed. Specifically, originators (brokers) began paying their employees based on how expensive the loan terms were (CFPB Loan Origination Compensation Requirements). Receiving a commission for selling a loan product is different from the sale of consumer goods because of the sheer size

[31] In addition to banks, mortgage brokers provided products and advice to borrowers.

of the loan amounts. As a result, the CFPB aims to reduce the knowledge gap between originators and consumers. As a backstop, the CFPB can also issue rules that prevent originators from engaging in certain activities or offering different products. Ultimately, the CFPB cannot completely close the knowledge gap as financial institution employees will almost always have more knowledge about the products they are selling. Since this fact remains, the CFPB may try to limit the types of products offered to those that are simple and do not require a lot of specialized knowledge. This should be to the benefit of the smaller banks because they have traditionally made conservative mortgage loans and few credit card loans. In the past, large banks have made money by originating a large volume of loans and pooling them. If the CFPB restricts or discourages this type of behavior, large banks could be adversely affected.

Forward-looking Takeaways:

How Will Regulatory Changes Affect Bank Behavior?

The proposed regulatory changes are intended to reduce the overall riskiness of the banking industry. This will occur in large part because of reduced leverage, more conservative lending, and increased regulatory scrutiny of banking activities. While the industry certainly moved ahead of regulators in the laissez faire regulatory environment prior to the financial crisis, it seems that now sentiment has shifted in favor of more regulation. Going forward, regulators should be able to keep abreast of industry activities because the range of permitted activities has been curtailed. This is opposite to the last time the regulatory environment underwent significant change in the late 1990s. For example, regulators permitted transactions such as the Citicorp and Travelers merger to occur, even before legislation repealing the Glass-Steagall Act had been enacted. Once the Gramm-Leach-Bliley Act (repealing Glass-Steagall and

the prevention of affiliation between securities firms and commercial banks) passed in 1999, a wide range of new activities could be pursued by banks. In many ways, it seems that from the late 1990s through the financial crisis, regulators were trying to catch up with the activities of the financial services industry.

As evidenced by the Fed's stress tests, regulators now have much more control over bank behavior, especially as it relates to capital planning and leverage. Not only must the largest banks submit capital plans to the Fed, but the Fed can reject those plans and prevent firms from repurchasing shares or paying a dividend. If used appropriately, this power should have significant potential to lessen the blow of the next crisis.[32] Another important dimension is the market discipline imposed by stress test announcements. When the markets learn that a particular bank's capital plan has been rejected by the Fed, the market can react, forcing bank managers to better manage capital.[33]

The Fed's authority to establish individual capital levels for the largest banks presents an opportunity for smaller banks. First, smaller banks are not subject to stress testing requirements. Second, it is unlikely that larger banks will be able to employ the levels of leverage they used in past. As I mentioned in the profitability decomposition section, this should level the playing field for smaller versus larger institutions.

[32] There is a downside associated with the capital restructuring: large banks may now face a higher cost of equity capital.

[33] In response to the Fed's March 14, 2013 capital plan announcements, there was a reaction in the stock market. Immediately following the announcements, JP Morgan and Goldman Sachs saw a quick 2% increase in their share prices. However, this increase was wiped out with share prices for JP Morgan falling 7% and Goldman Sachs falling 9% from where each started on March 14. In addition, BB&T fell about 7%. Only Ally Financial did not experience a significant decline in its share price (possibly as a result of investors' previous expectations given the health of Ally Financial. Over the same course of time, both the S&P 500 and the Financial Select Sector SPDR (XLF) are up about 1%. Neither of these benchmarks was less than 3% below its value as of March 14.

In addition, all banks will need to change their behavior in order to comply with CFPB rules. However, the changes are likely to have greater impact on the larger banks. In the short-run, banks should be more cautious in selling loans to consumers. This will take place for two main reasons. First, the CFPB is in the process of establishing strict guidelines for many loan products. Second, after the recent housing bubble and economic downturn, lenders are more concerned with avoiding credit losses and are voluntarily screening out less creditworthy borrowers. However, if the economy "heats up" again in the future, regulators must be prepared to monitor and use their new powers to avoid competitive excesses.

What are the Effects on Bank Customers; How Will the Bank/Customer Relationship Change?

One of the biggest effects on bank customers of the financial crisis and the subsequent regulatory changes has already been felt. Prodded by both regulatory and market forces, banks' deleveraging and recapitalization efforts have made it much more difficult for customers to gain access to credit. Even with banks holding about $1.6 trillion of excess reserves as of March 2013 (St. Louis Fed), underwriting standards have tightened and credit for both businesses and consumers remains extremely tight except for the most creditworthy borrowers. Presumably, if banks felt they could make more money from loaning their excess reserves, they would already be doing so. It seems that the banks' response to the low interest rate environment is to proceed with caution. With interest rates expected to rise in the future, the risk of making longer term low-rate loans outweighs the profit opportunities of these loans. Because the duration of mortgage loans exceed that of most banks' funding sources, if these loans were held on bank balance sheets, banks would experience significant losses when interest rates rose. This risk may explain why banks are not lending as much. At the end of the fourth quarter

2012, outstanding debt still lagged $1.3 trillion behind the third quarter 2008 level and $200 billion behind fourth quarter 2011 (van der Klaauw 2013).[34] The year-over-year decrease in debt outstanding is evidence that lenders and consumers are still deleveraging.

Another part of the problem is that consumers are avoiding risk-taking as well. In response to the financial crisis, savers and investors pulled large amounts of money from equities and equity mutual funds and have been holding large amounts of cash as bank deposits. The level of deposits is another component in determining bank reserves at the Fed. Aggregate commercial bank data (displayed in Figure 17) from the Fed's H.8 Statistical Release show that deposits have been increasing annually since the end of the financial crisis. Conversely, C&I, consumer, and real estate loans each declined after the financial crisis. C&I loan balances have recently begun increasing again as has consumer lending. Real estate loan balances are still slowly decreasing.

With more restrictive lending standards, some consumers may substitute more expensive sources of credit such as payday lenders and credit cards. To meet the credit needs of less creditworthy consumers, two new trends have taken hold. The first, called peer-to-peer lending, involves lending between unrelated individuals done without the help of a traditional financial intermediary such as a bank. Peer-to-peer lending takes place online with borrowers applying for credit and savers providing funds. Peer-to-peer lenders screen applicants and quantify how risky they are by assigning an interest rate. In today's low interest rate environment, this idea has caught on because savers are finding it difficult to earn high returns with bank savings products. At the same time, less creditworthy borrowers have been shut out

[34] Includes both housing and non-housing household debt

by traditional lending sources. One leading peer-to-peer lender, Lending Club, is projected to make about $1.5 billion in loans this year (Farzad 2013). The second trend, called crowd funding, is similar to peer-to-peer lending in that it avoids the use of traditional financial intermediaries such as banks. The general idea behind crowd funding is that someone comes up with an idea and brings that idea to others online to see if the idea merits funding (Wiederman 2012). For individuals rejected by a bank, crowd funding can be another potential alternative for funding. Both of these trends based on a creative use of new technology could threaten the traditional source of bank profits. These mechanisms circumvent the reforms to consumer lending such as the CFPB unless its scope is broadened.

Another threat to banks and traditional lenders comes from companies such as Wal-Mart, Google, and Amazon that are increasing their credit offerings. For example, Wal-Mart recently entered into an agreement with American Express to provide prepaid credit cards and debit accounts. Google has been testing loans to customers to purchase Google AdWords. Amazon has gone directly after a traditional banking service – giving heavy small business users lines of credit. Although these each represent threats to traditional banks, none of these companies has been able to really provide credit on its own; each has relied on a partnership with a financial company (Handley 2012). Market research done by Carlisle & Gallagher Consulting Group shows possible openings for nonbanks, especially in the area of mortgage lending. For banks the most troubling findings of the CGCG survey were that 80 percent of consumers would consider a mortgage from a nonbank and that 56 percent of consumers said that slow execution on the part of banks makes the mortgage application “painful”. Additionally, 26 percent said that banks provide “untrustworthy advice” (Carlisle & Gallagher

Consulting Group 2012). Assuming that these findings are correct, they could make it tempting for a company such as Wal-Mart (or another large, non-financial company looking for growth) to enter the mortgage market. There would certainly be regulatory challenges for a company to enter the market, but there is the potential for these companies to have significant advantages over banks. For one, many large corporations currently have cash positions above their operating needs. Since these companies already have funds, they would therefore not have to incur costs in raising and servicing deposits. This advantage could be used to price loans below those offered by traditional banks.

Overall, each of these threats to traditional banks rely on one of two main ideas: giving credit to consumers who cannot obtain it from traditional sources and having lower costs than traditional institutions, enabling them to offer loans at lower rates. Even with these threats, traditional banks as a group will still exist because they hold several advantages over nonbank institutions. First, deposit insurance is an important selling point. Given the flight from risk assets to cash deposits in response to the financial crisis, the safety provided by deposit insurance is quite important to individuals and businesses. Another advantage banks hold over other firms is that they and their employees have knowledge and experience in providing for customers' financial needs. A third advantage that banks hold over nontraditional lenders is that the banking industry as a whole is relatively tightly regulated. Strong regulation can benefit consumers in that it can prevent abuse from banks. Another advantage the banks have is the sheer size of the mortgage and other loan markets. Loans made in these markets total trillions of dollars each year – even if large non-bank corporations were to enter these market, they would not likely control a large portion of the overall market.

To combat these threats, banks must sell these points to their customers. However, in the short-run this may be difficult to achieve because many consumers do not trust banks and are not particularly happy with the low returns earned by their insured deposits. In the long-run, it is in these deposit relationships that banks can retain their relevancy with consumers. The deposit-taking function banks perform is very important to the economy because these accounts are an important part of the payments mechanism. As such, the need for banks to provide this service should not diminish and while performing the payment-making and deposit-taking functions puts costs on banks, they should continue to use their position to cross-sell other products. Therefore, banking institutions that can perform these two functions well, and provide a full-range of other financial products to their customers should be able to withstand the threats of nonbank institutions.

What Does the Future Look Like for Bank Consolidation?

Overall, banking consolidation should continue rather slowly. Bank mergers, especially in the short-run should not be very high because of the new regulatory environment. Many banks will continue to focus on improving their balance sheets and risk management systems in response to recent regulatory changes. Additionally, the new threshold of $10 billion in assets resulting in additional reporting and stress testing requirements should discourage many banks with assets around that threshold from crossing it. If this is the case, the majority of bank mergers should occur between banks with lower amounts of assets. For banks already over $10 billion in assets, it may not make as much sense as it has in the past to merge. The evidence suggests that there do not appear to be very large economies of scale. Additionally, if two large banks were to merge, there may be regulatory and public opposition over the perpetuation and

expansion of TBTF. Depending on how costly this opposition would be to fight, large banks may decide it is not worth their resources to merge with one another. Similarly, given the sheer size of some of the largest institutions, it may not be worth the trouble to merge with a much smaller competitor.

V. Conclusion

On several different fronts, smaller banks are in a much stronger position than they have been in since the early 1990s. Regulatory reform in response to the financial crisis poses a challenge to the banking industry as a whole, but arguably leaves smaller banks in a better position than the larger banks. This is the case because many of the root causes of the financial crisis were the tremendous systemic risks posed by the potential failure of any of the largest institutions. As a result, regulatory reform has focused on large banks, potentially limiting both leverage and revenue-generating ability. In addition to having this advantage over the largest banks, the smallest banks should have optimism for one other reason: post-financial crisis, the difference in profitability between the largest and the smallest banks is small by historical standards. As a result, smaller institutions have a brighter future than the larger institutions that continue to deleverage and regain their health, especially in the long-run.

Difficulties for the industry as whole remain, however. One major trend negatively affecting the banking industry is the changing nature of financial intermediation. Intermediation has become increasingly fractionalized over the past three decades as a larger variety of non-traditional intermediaries are competing against banks. These other entities often face a lower regulatory burden than banks. Additionally, disintermediation has been a significant challenge

to the industry as more and more business entities have direct access to credit and capital markets. Looking at securitization also shows that disintermediation has been seen in markets in which banks have previously been major players, such as residential and consumer lending. Even in the face of these challenges, banks still provide several services of significant economic benefit such as providing a payments mechanism, offering loan products, and helping the Fed conduct monetary policy. While nonbank competitors may try to chip away at these traditional banking functions, for the time being, banks have advantages such as expertise and deposit insurance that nonbanks do not have.

Another troubling trend for the industry is that revenues as a percent of assets have fallen steadily since the early 1990s. Both major components of bank revenue, net interest income and non-interest income have fallen over that span. Net interest income has fallen mainly in response to a diminished net interest margin. Falling interest rates and the changing shape of the yield curve help to explain this decline. Reduced non-interest income has come about through a combination of increased competition and a decline in economic activity as a result of the financial crisis and the regulatory response that has capped some fees. The diminished outlook for increasing non-interest income and the fact that larger banks rely more heavily on non-interest income, mean that smaller banks should fare better than the larger banks. The Fed has signaled that it will continue to keep short-term interest rates low until 2015 in addition to continuing its easing efforts until the labor market improves. As a result, net interest margins may remain depressed until the Fed shifts its policy. Operating costs also weigh on bank profitability. While smaller banks have somewhat higher operating costs as a

percent of assets, the spread between their operating costs and the larger banks' has narrowed. This is another positive sign for smaller institutions.

Overall, the next decade may be one of transition for the banking industry as it tries to adjust to the new regulatory environment and continuing low interest rates. As a whole, the banking industry's health and soundness is improving significantly as deleveraging occurs. This is good news for the industry, as being healthy financially will leave the industry in a better position to compete with less regulated financial intermediaries. Competitively, the banking industry must engage individuals and firms in areas in which it provides vital economic services such as a payments mechanism and consumption-smoothing lending products. If the economy of the next decade does not experience rapid growth, smaller banking institutions stand to benefit because they perform these particular functions very well. In addition to being at a disadvantage on these grounds, larger institutions should continue to face more regulatory scrutiny as international capital regulations are phased in.

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Figure 1: Assets of Financial Intermediaries (1980 – 2012)

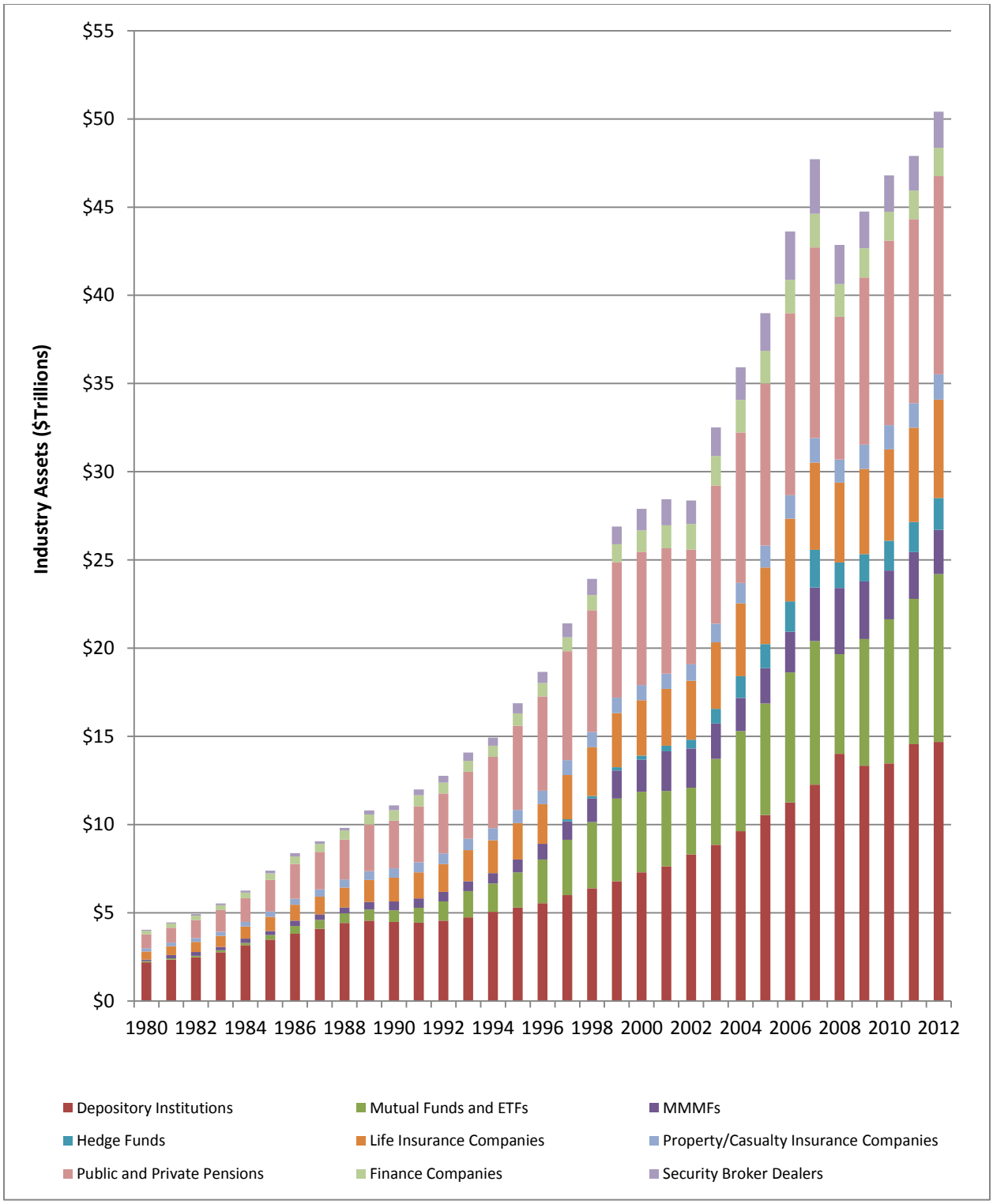

Figure 1: Financial intermediary assets 1980 – 2012. Industry assets have grown significantly from 1980 ($4 trillion) to 2012 ($50 trillion). *Source: Federal Reserve Statistical Release, Z.1, Flow of Funds Accounts of the United States*

Figure 2: Market Share of Financial Intermediaries (1980 – 2012)

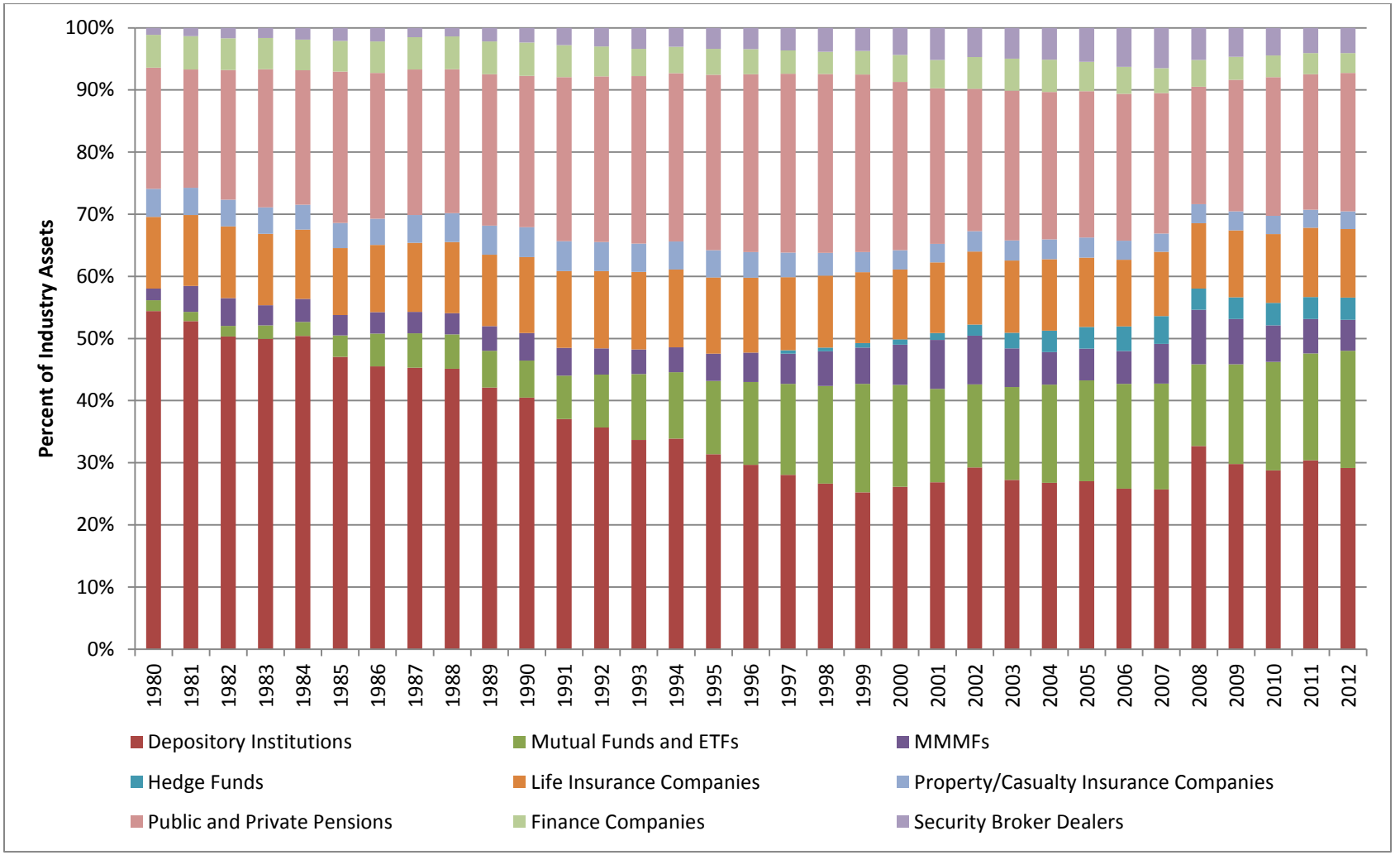

Figure 2: Market share of financial intermediaries, 1980 – 2012. The percent of assets held by depository institutions has fallen from over 50% to 30% since 1980. Mutual funds and ETFs, Money Market Mutual Funds (MMMFs), and hedge funds have grown their market shares the fastest since 1980. Depository institutions, property/casualty insurance companies, and finance companies have lost market share. *Source: Federal Reserve Statistical Release, Z.1, Flow of Funds Accounts of the United States*

Figure 3: Federal Reserve Discount Rate and Federal Funds Rate (2003 – 2013):

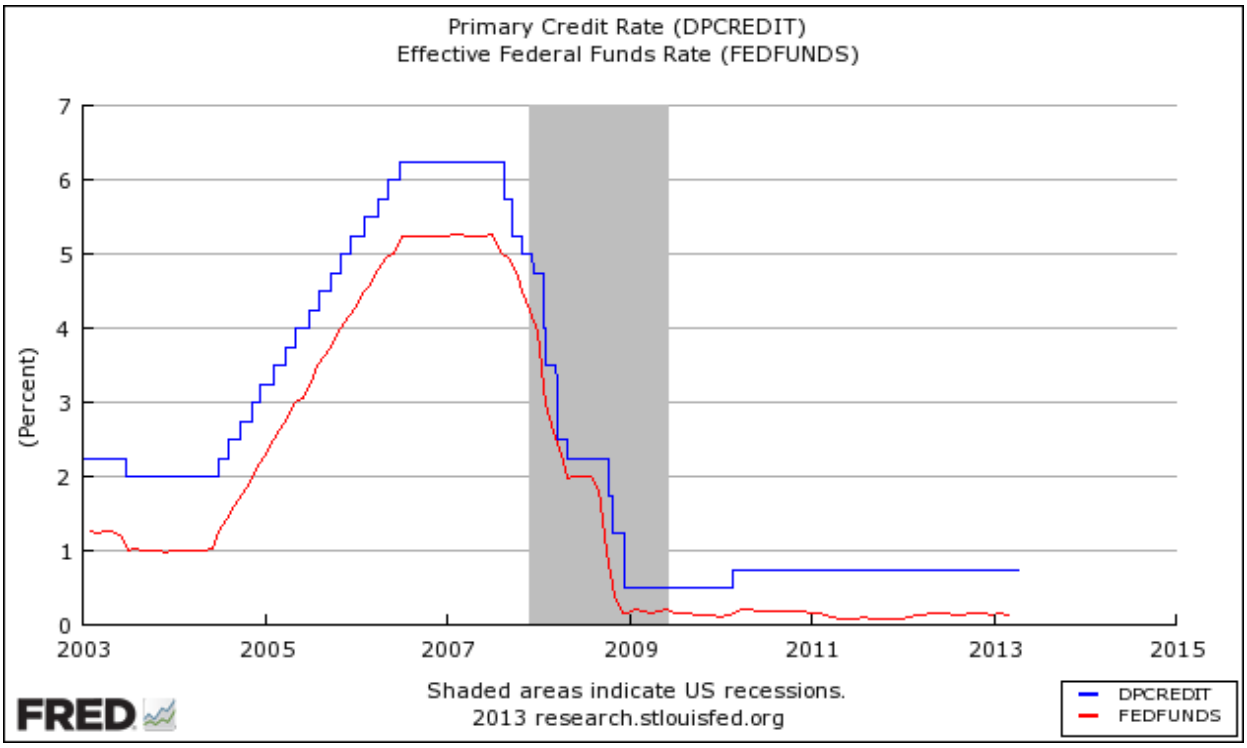

Figure 3: Federal Reserve Discount Rate and Federal Funds Rate, 1980 – 2013. In setting its monetary policy, the Fed determines the level of these two rates. *Source: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED)*

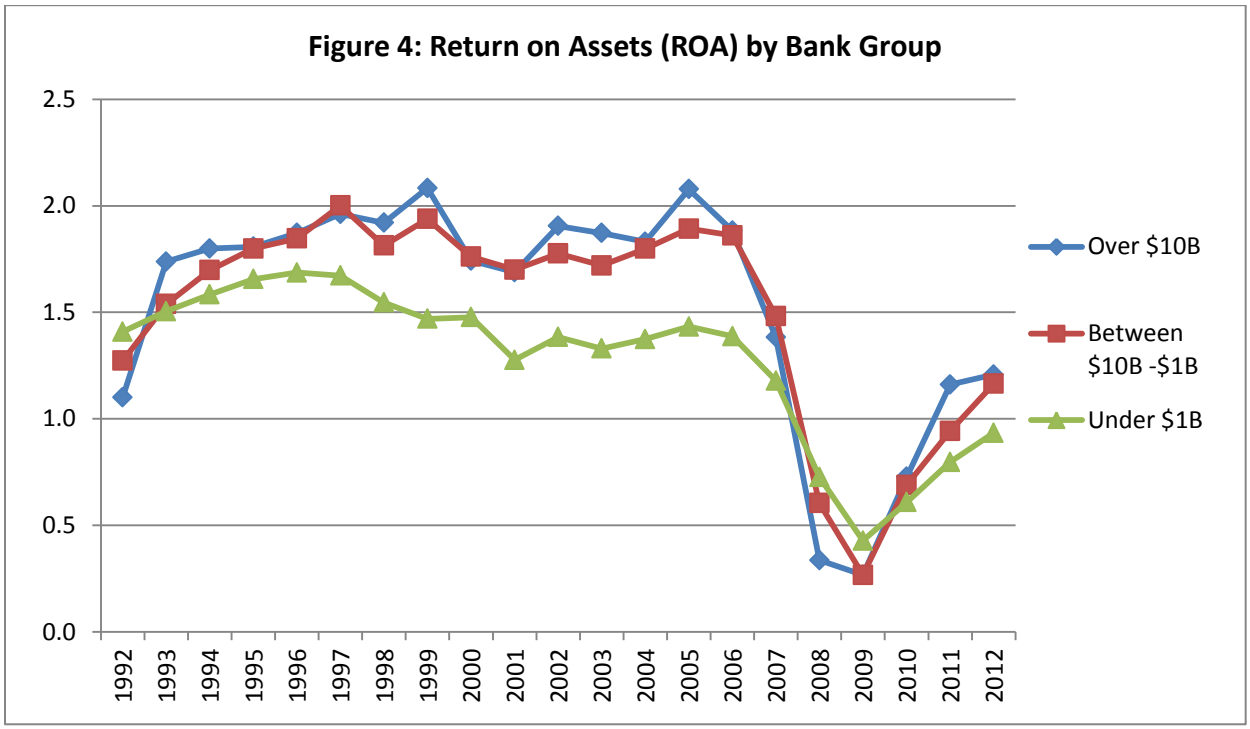

Figure 4: Return on Assets (pretax income/average assets) by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

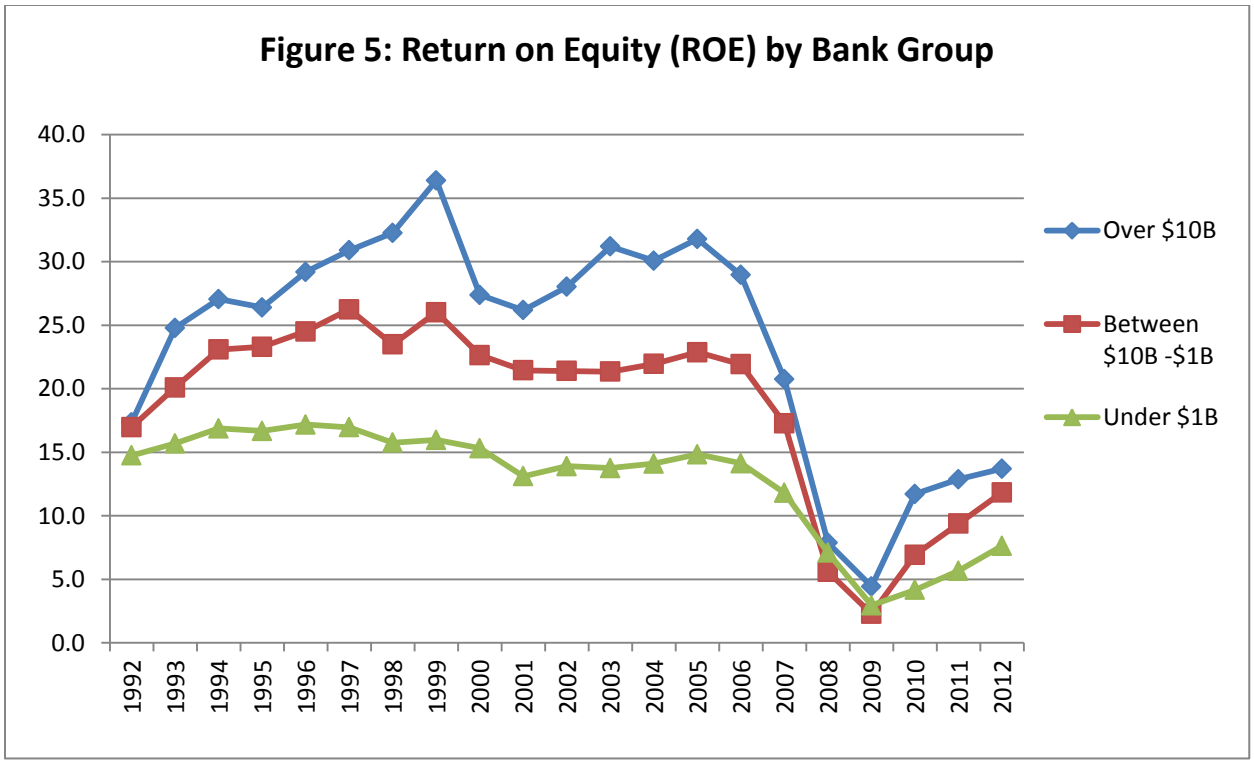

Figure 5: Return on Equity (pretax income/average equity) by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

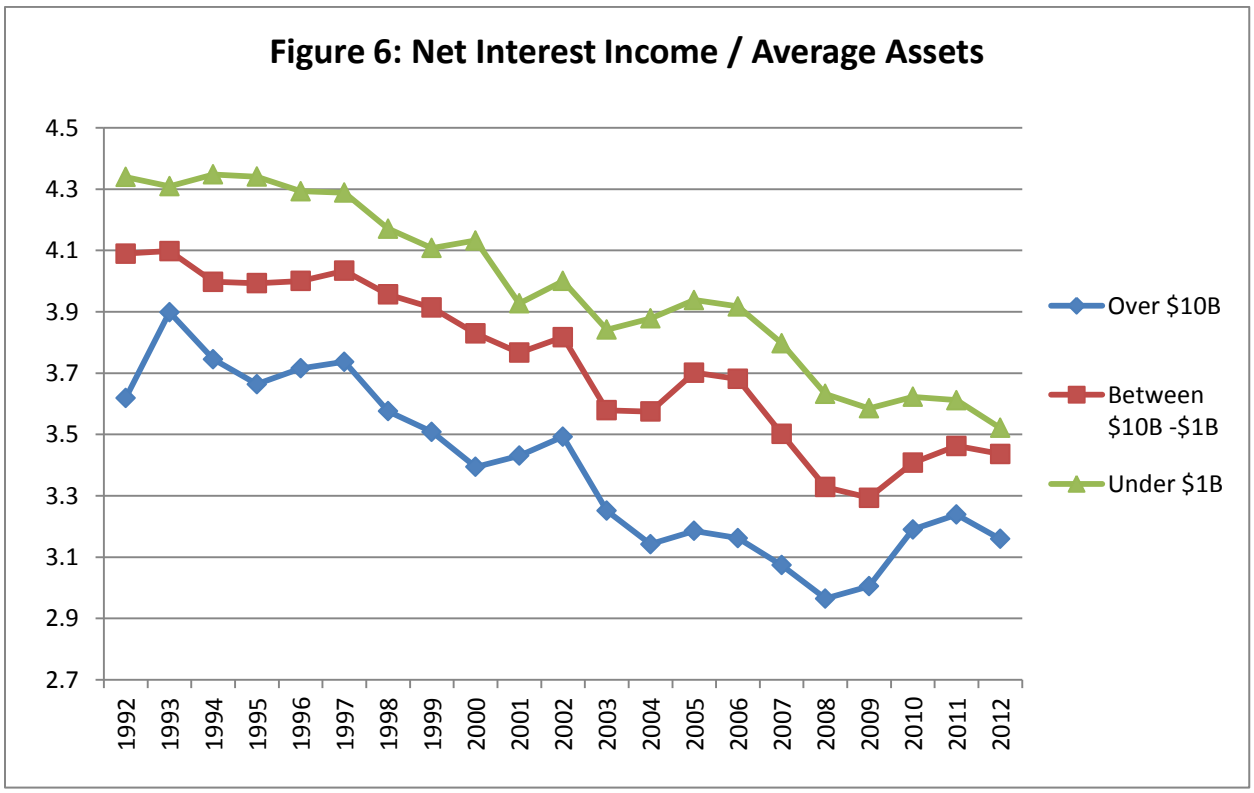

Figure 6: Net interest income (interest income – interest expense) divided by average assets by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

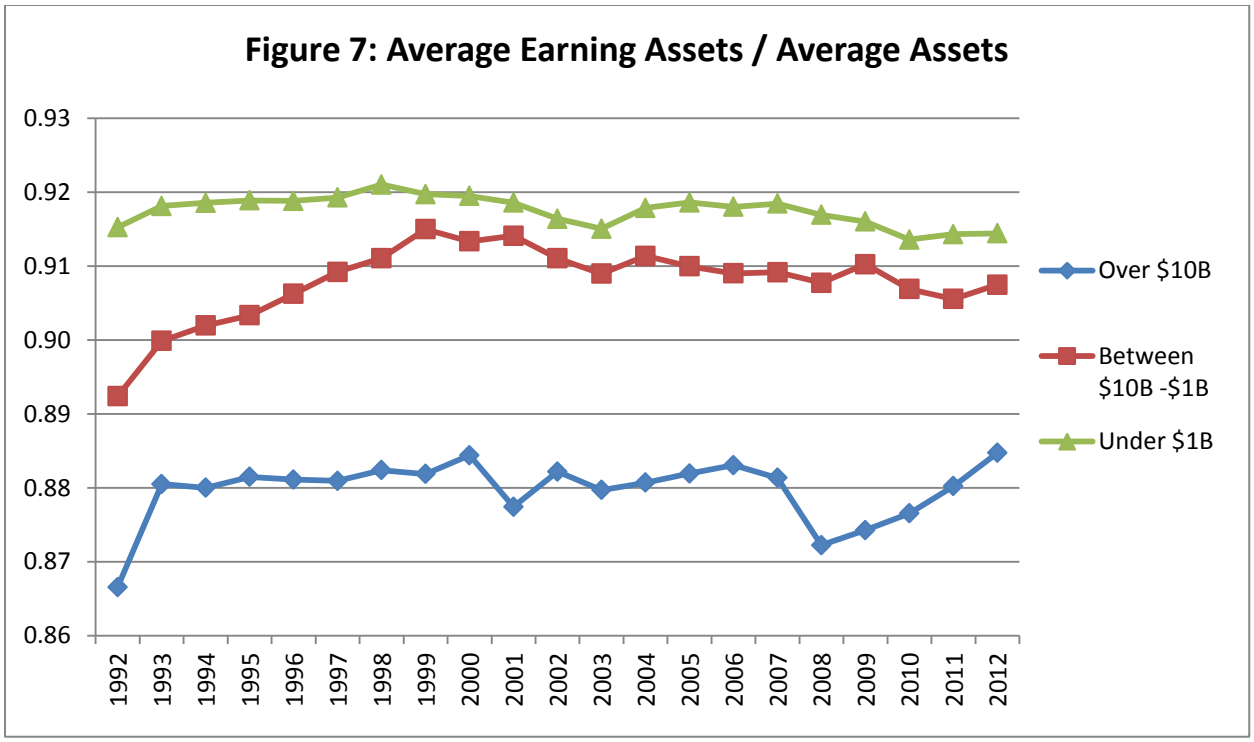

Figure 7: Average earning assets divided by average assets by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

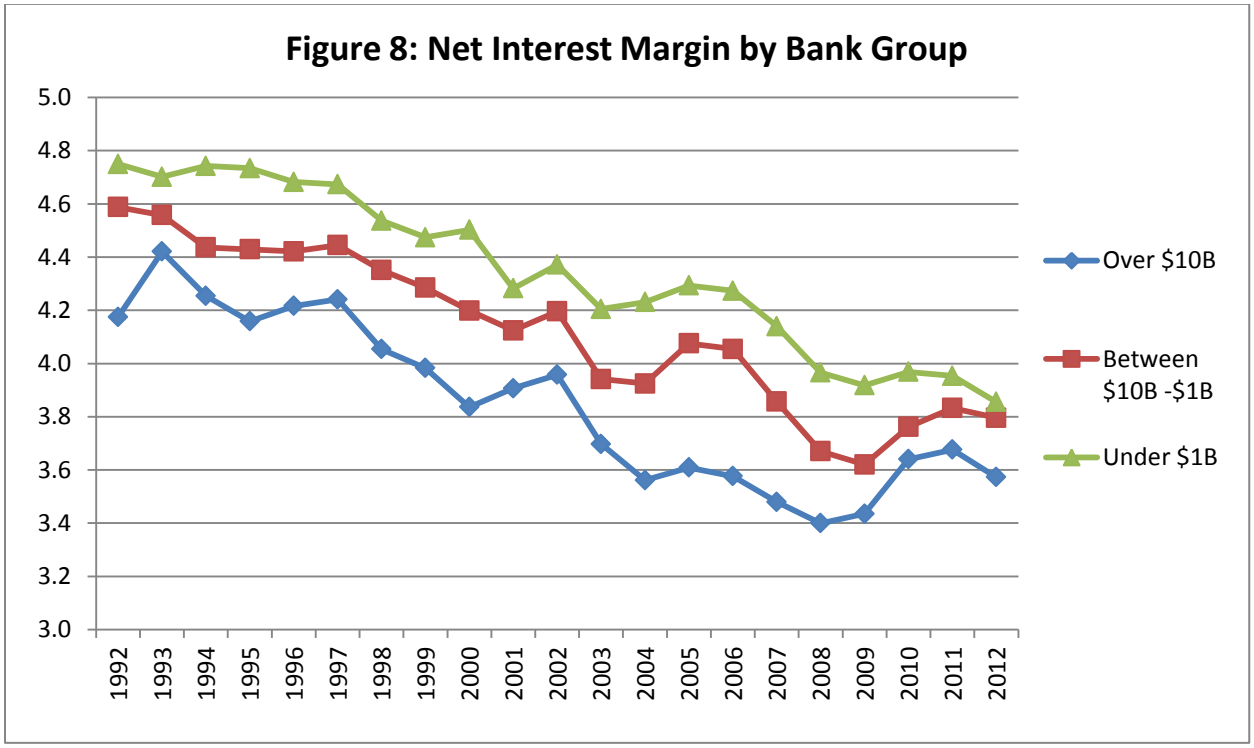

Figure 8: Net interest margin [(interest income – interest expense)/average earning assets] by bank group, 1992 – 2012. Average earning assets is the average of all loans and other investments that earn interest or dividends. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

Figure 9: U.S. Treasury Yield Curve, June 29, 1992 and June 29, 2012

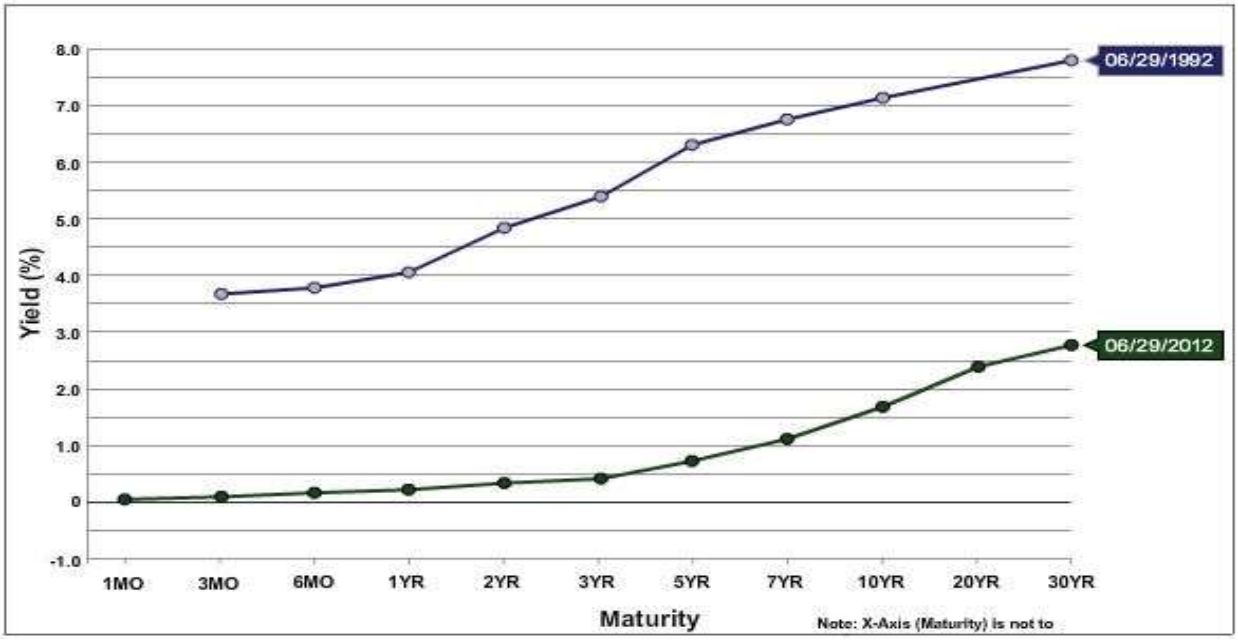

Figure 9: U.S. Treasury Yield Curve, June 29, 1992 and June 29, 2012. The 1992 term structure shows both higher overall interest rates and a steeper slope than the 2012 curve. Many rates banks use for loan and savings products are based off of Treasury rates. A steeper slope may indicate that banks are able to generate more interest income than with a flatter yield curve. *Source: U.S. Treasury Resource Center, Data and Charts Center, Interest Rate Statistics, Historic Yield Data*

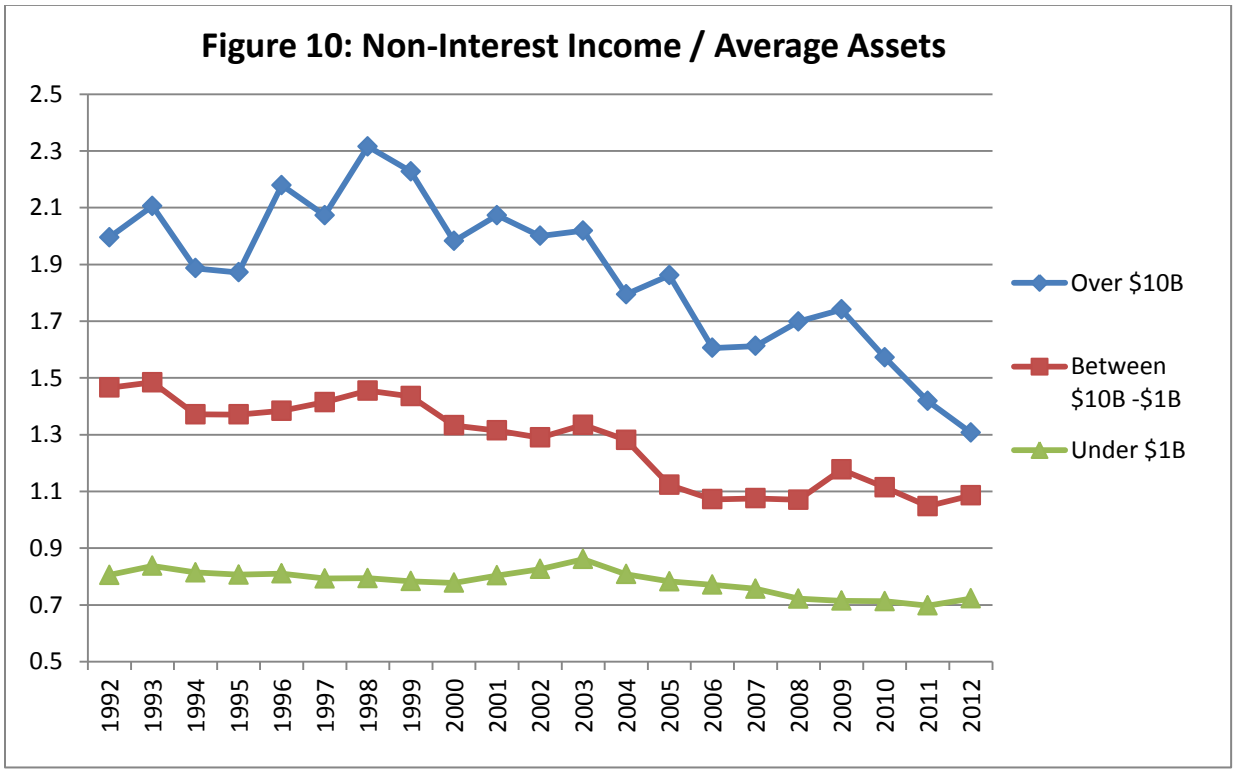

Figure 10: Non-interest income (including fees and other charges for services) by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

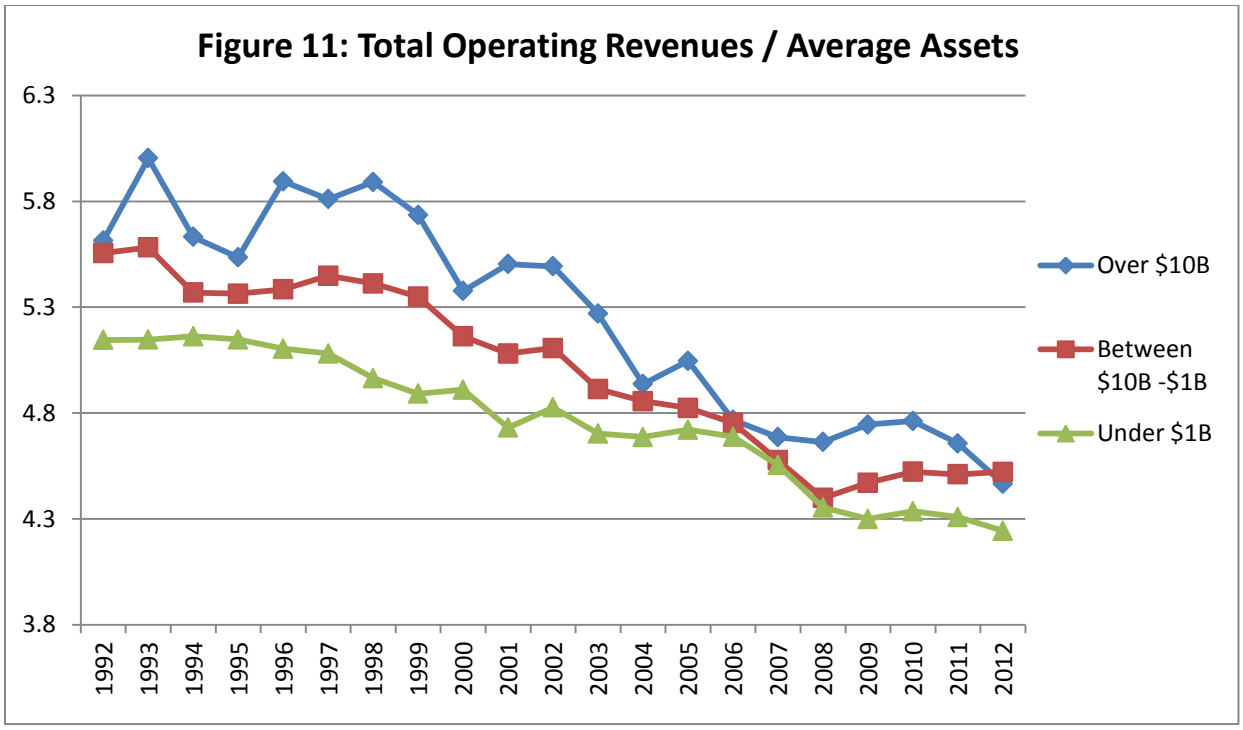

Figure 11: Total operating revenues divided by average assets, by bank group, 1992 – 2012. Total operating revenues is equal to the sum of interest and non-interest income divided by average assets. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

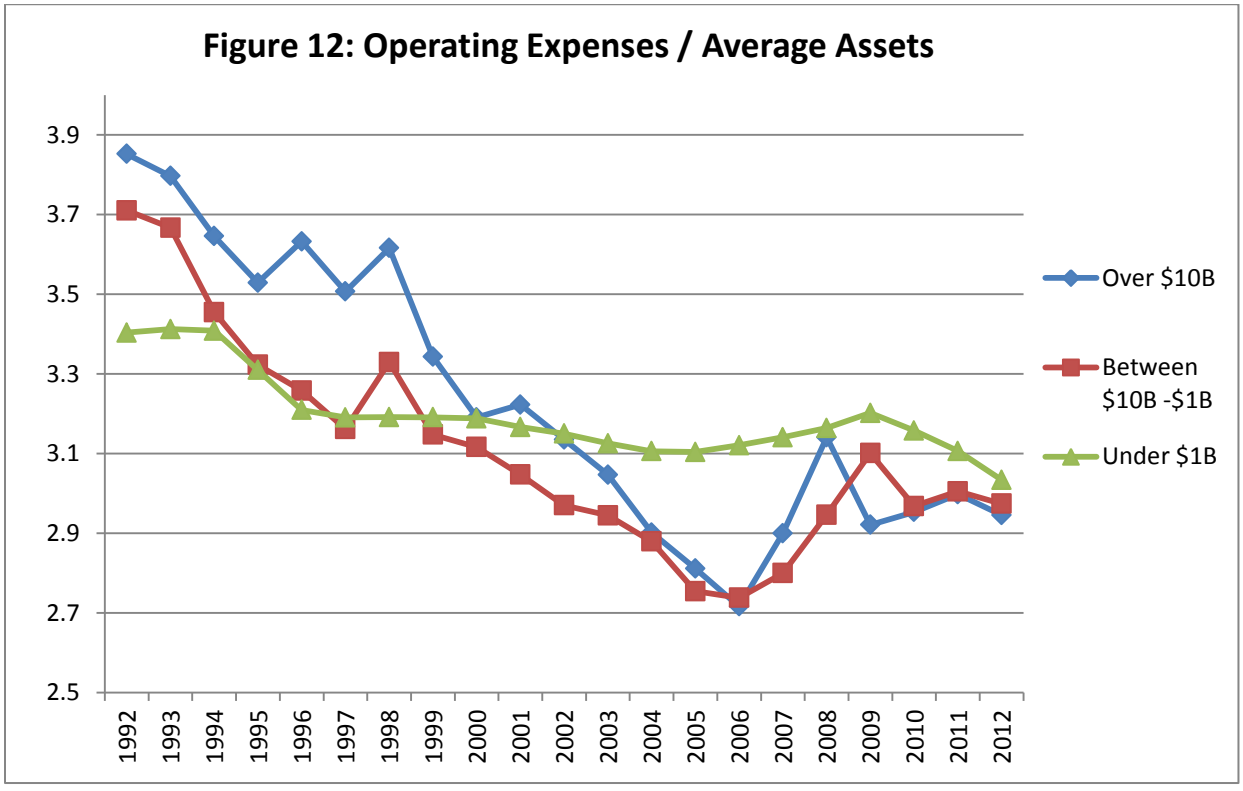

Figure 12: Operating expenses divided by average assets by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

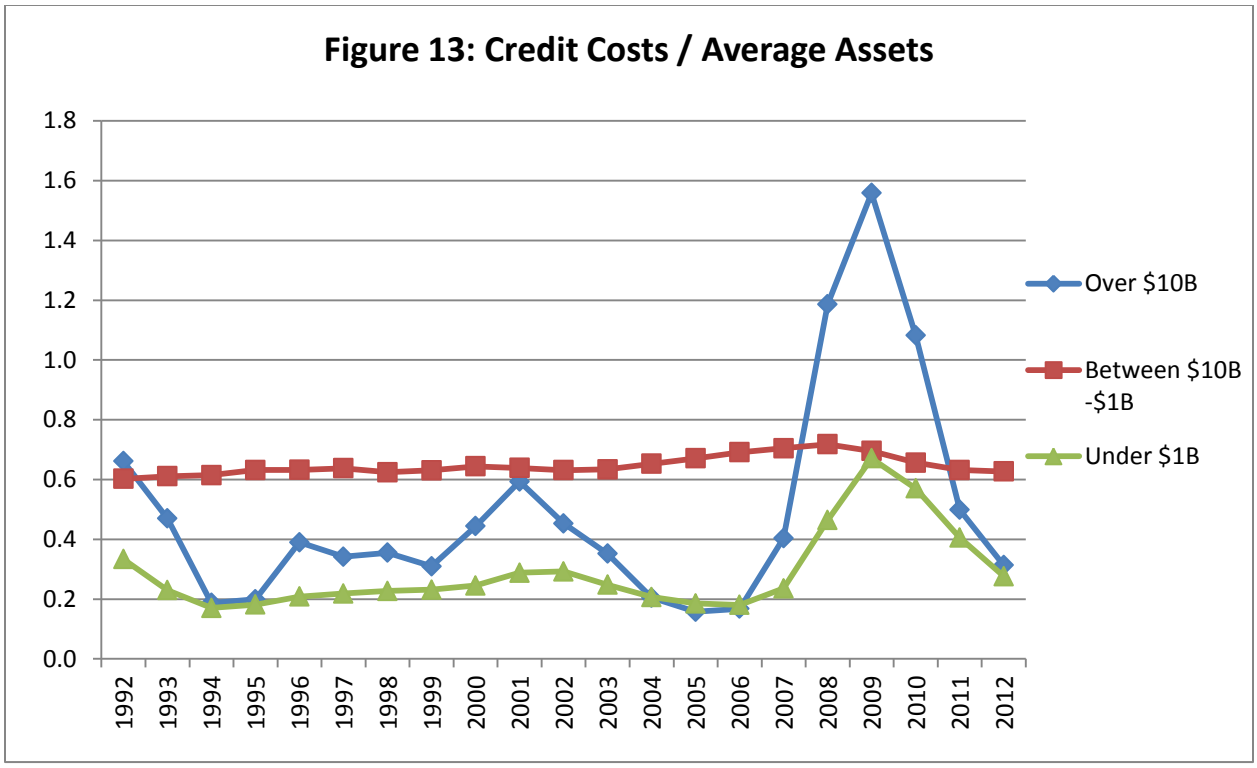

Figure 13: Credit costs divided by average assets by bank group, 1992 – 2012. Credit costs are defined as a bank's provision for loan losses. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

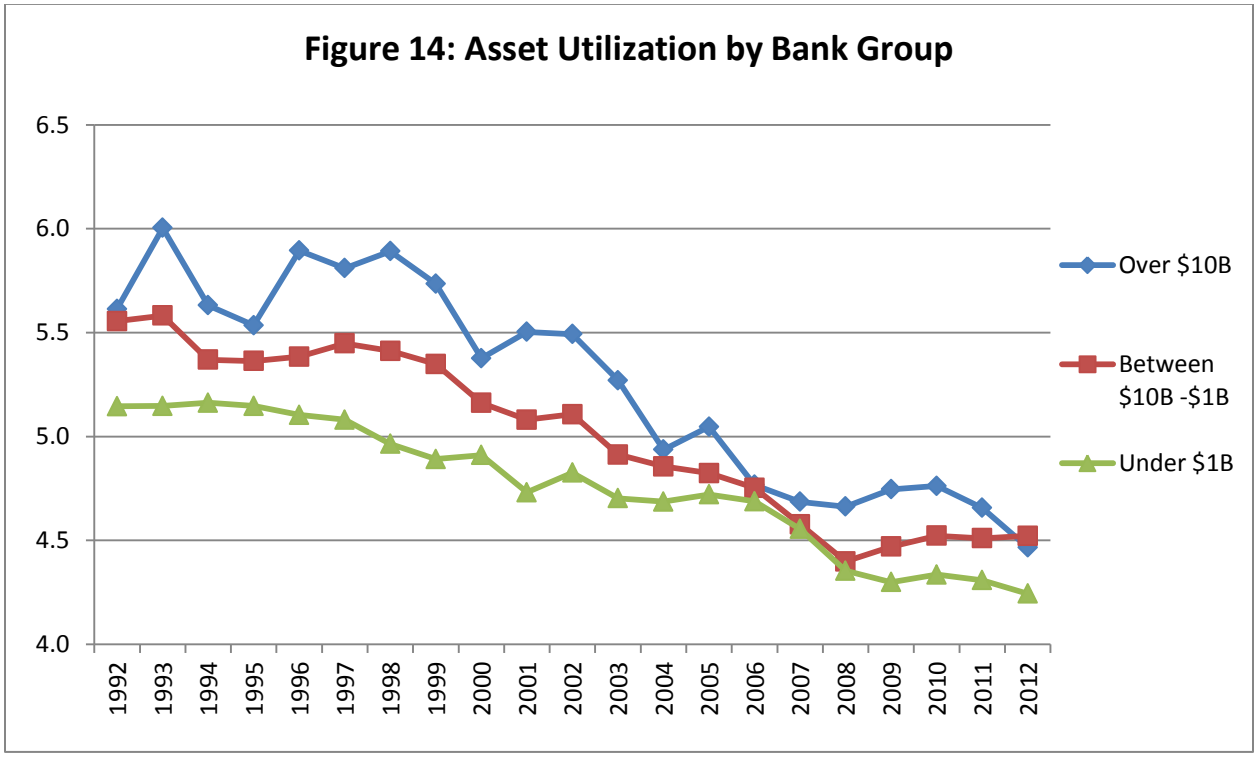

Figure 14: Asset Utilization (total revenue divided by average assets) by bank group, 1992 – 2012. Asset Utilization is a measure of how productive a bank is at generating revenue with its level of assets. Diminished interest income due to a low interest rate environment has reduced asset utilization. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

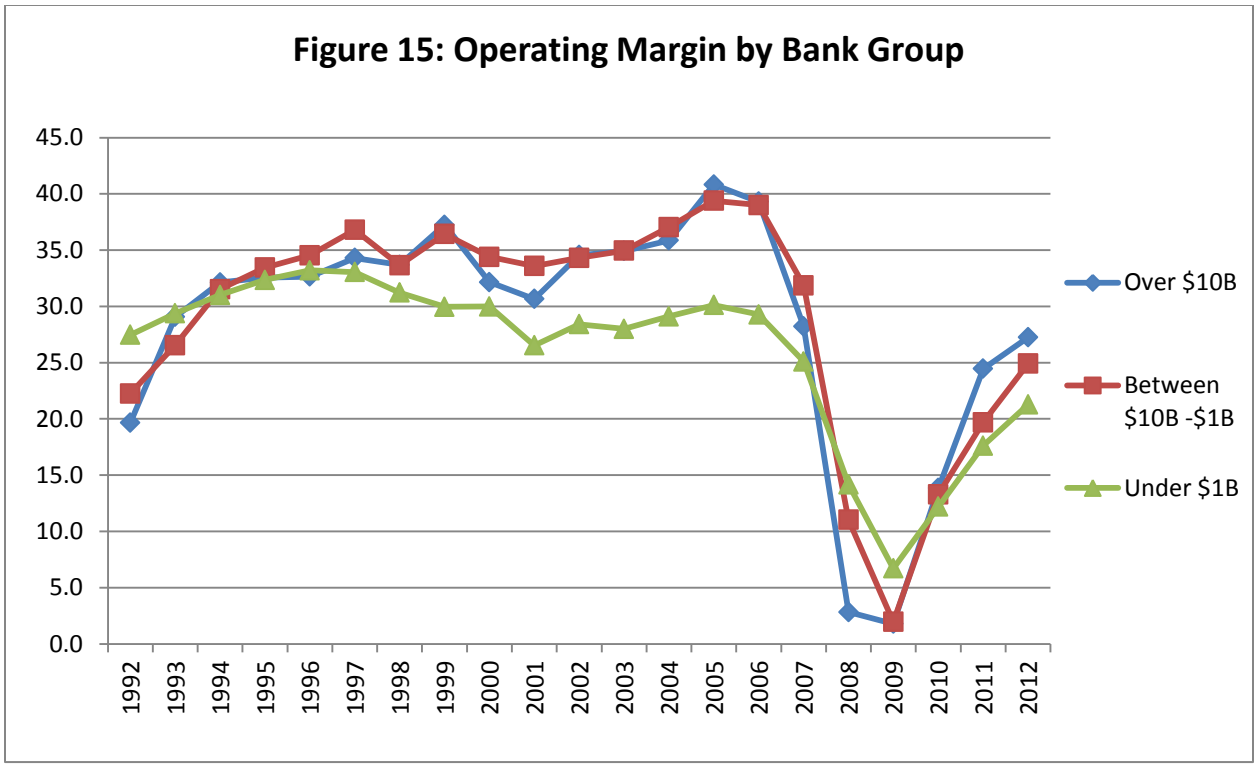

Figure 15: Operating Margin (pretax net income divided by revenue) by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

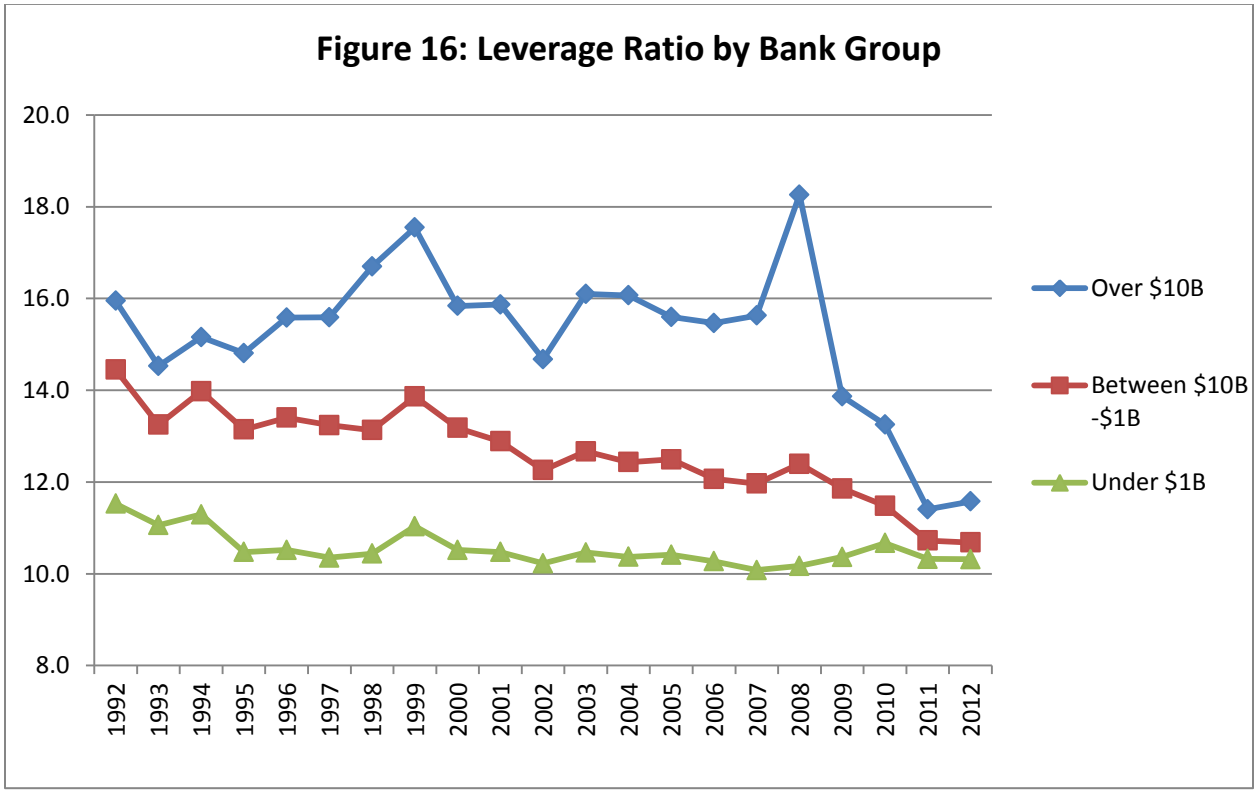

Figure 16: Leverage Ratio (average assets divided by tangible common equity) by bank group, 1992 – 2012. *Source: Federal Deposit Insurance Corporation, Statistics on Depository Institutions*

Figure 17: Percent Change in Loan and Deposit Volume, all Commercial Banks (1992 – 2012)

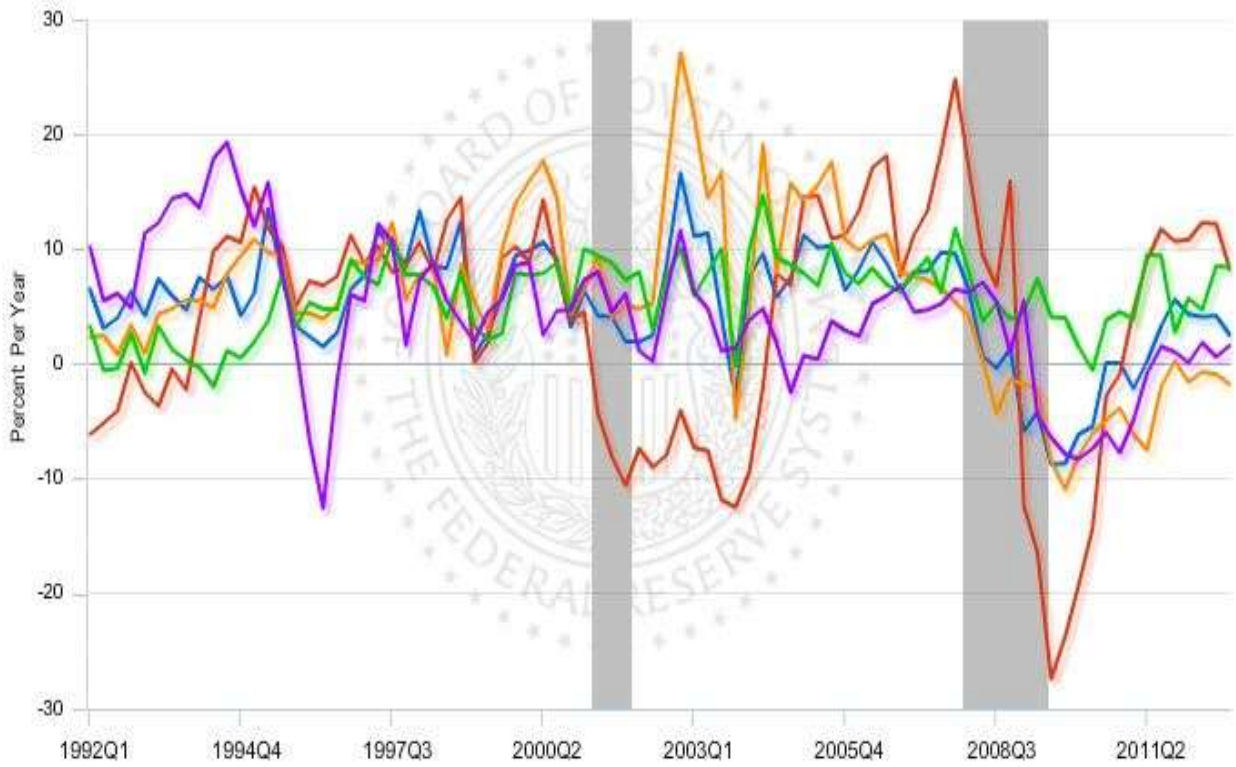

Figure 17: Change in loan volume (by loan type) and deposits across commercial banks, 1992 – 2012. *Source: Board of Governors of the Federal Reserve System*

Legend:	
	Bank credit, all commercial banks, seasonally adjusted, annual growth rate
	Commercial and industrial loans, all commercial banks, seasonally adjusted, annual growth rate
	Real estate loans, all commercial banks, seasonally adjusted, annual growth rate
	Deposits, all commercial banks, seasonally adjusted, annual growth rate
	Consumer loans, all commercial banks, seasonally adjusted, annual growth rate

Table 1, Examples of Services Provided by Different Intermediaries:

Service Provided	Types of Intermediaries
Banking and Deposit-taking Services	Commercial Banks, Savings Institutions, Credit Unions
Insurance Services	Life Insurers, Property-Casualty Insurers
General Investment Services	Money Market Mutual Funds (MMMFs), Mutual Funds, Hedge Funds, ETFs, REITs
Pension Investment Services	State and Local Governments, Federal Government, Private Pension Funds
Market-Making Services	Broker-Dealers

Table 1: *Source: "Financial Institutions, Markets, and Money". Kidwell, 38-9.*

Table 2, Annual Growth Rate of Types of Financial Intermediaries, 1980-2012:

Category	Annual Growth
Depository Institutions	9.0%
Mutual Funds and ETFs[35]	25.0%
Money Market Mutual Funds	17.2%
Hedge Funds	20.0%
Life Insurance Companies	11.9%
P/C Insurance Companies[36]	9.8%
Public and Private Pensions	12.9%
Finance Companies	9.6%
Security Broker- Dealers	18.9%
All Intermediaries	**12.2%**

Table 2: *Source: Federal Reserve Z.1 Statistical Release, 1975 – 2012.*

[35] Exchange-traded funds
[36] Property/Casualty Insurance Companies

Table 3, Asset Allocation, September 30, 2012 (Percent of Total Assets):

	All Commercial Banks	Very Small <$100M	Small >$100M and ≤$1B	Large >$1B and ≤$10B	Largest ≤$10B
Number of Institutions	6,168	2,034	3,608	437	89
Cash	9.40%	11.94%	8.64%	7.96%	9.60%
Interest-bearing Balances[37]	7.64%	8.02%	6.43%	6.22%	7.90%
Fed. Funds Sold & Rev. Repos	3.73%	2.72%	1.23%	0.36%	4.34%
Securities	20.69%	24.90%	22.96%	21.92%	20.29%
Net Loans & Leases[38]	51.60%	55.30%	61.10%	62.05%	49.52%
Trading Account Assets	5.49%	0.01%	0.01%	0.09%	6.66%
Bank Premises	0.86%	1.64%	1.84%	1.47%	0.69%
Real Estate Owned[39]	0.28%	0.90%	0.98%	0.71%	0.16%
Goodwill/ Intangibles[40]	2.67%	0.30%	0.49%	1.57%	3.03%
All Other Assets[41]	5.28%	2.28%	2.73%	3.87%	5.71%

Table 3: Source: Federal Deposit Insurance Corporation, Statisitics on Depository Institutions

[37] Savings or time balances, including certificates of deposit that are due from other depository institutions
[38] Total loans and lease financing receivables minus unearned income and loan loss allowances
[39] Includes direct and indirect investments in real estate; the amount is reflected net of valuation allowances.
[40] Includes goodwill, mortgage servicing rights, purchased credit card relationships, and other identifiable assets
[41] Includes investments in unconsolidated subsidiaries, customers' liability on acceptances outstanding, income earned not collected on loans, net deferred tax assets, excess residential mortgage servicing fees receivable, and other assets

Table 4, Liabilities and Equity, September 30, 2012 (Percent of Total Assets):

	All Commercial Banks	Very Small <$100M	Small >$100M and ≤$1B	Large >$1B and ≤$10B	Largest ≤$10B
Number of Institutions	6,168	2,034	3,608	437	89
Total Liabilities	**88.52%**	**88.15%**	**89.11%**	**88.06%**	**88.51%**
Total Deposits	73.62%	85.18%	83.90%	78.33%	71.99%
Int-bearing Deposits	55.04%	68.81%	68.55%	62.70%	52.75%
Fed Funds & Repos	3.55%	0.43%	1.38%	3.45%	3.81%
Trading Liabilities	2.21%	0.00%	0.00%	0.04%	2.68%
Other Borrowed Funds	5.39%	1.90%	3.05%	4.80%	5.72%
Subordinated Debt	0.85%	0.01%	0.02%	0.09%	1.02%
All Other Liabilities	2.89%	0.63%	0.76%	1.35%	3.29%
Total Equity Capital	**11.48%**	**11.85%**	**10.89%**	**11.94%**	**11.49%**
Total Bank Equity Capital	11.34%	11.85%	10.88%	11.89%	11.32%
Other Equity Capital	0.14%	0.00%	0.01%	0.05%	0.17%

Table 4: *Source: Federal Deposit Insurance Corporation, Statisitics on Depository Institutions*

Table 5, Securities, September 30, 2012 (Percent of Total Assets):

	All Commercial Banks	Very Small <$100M	Small >$100M and ≤$1B	Large >$1B and ≤$10B	Largest ≤$10B
Securities	20.69%	24.90%	22.96%	21.92%	20.29%
U.S. Govt.	13.05%	15.55%	15.28%	15.84%	12.51%
Mortgage-Backed Securities	11.73%	7.50%	9.77%	12.38%	11.91%
Local Govt. Securities	1.84%	8.42%	6.49%	3.65%	1.11%
Other[42]	3.65%	0.07%	0.19%	0.67%	4.35%

Table 5: *Source: Federal Deposit Insurance Corporation, Statisitics on Depository Institutions*

[42] Includes foreign debt securities, structured financial products, and Asset-Backed Securities

Table 6, Net Loans and Leases, September 30, 2012 (Percent of Total Assets):

	All Commercial Banks	Very Small <$100M	Small >$100M and ≤$1B	Large >$1B and ≤$10B	Largest ≤$10B
Net Loans and Leases	**51.60%**	**55.30%**	**61.10%**	**62.05%**	**49.52%**
Real Estate Loans[43]	**27.31%**	**37.28%**	**46.67%**	**42.92%**	**23.65%**
Const. and Land Dev.	1.49%	2.32%	4.28%	3.85%	0.96%
Commercial Real Estate	7.39%	12.03%	20.57%	19.55%	4.76%
Other Non-farm Non-res.	4.05%	5.50%	10.17%	10.99%	2.71%
Multifamily Residential	1.33%	1.07%	2.21%	2.70%	1.11%
1-4 Family Residential	16.09%	15.39%	16.27%	15.61%	16.12%
Farmland	0.53%	6.46%	3.34%	1.19%	0.12%
C&I Loans[44]	**10.72%**	**7.68%**	**8.95%**	**11.55%**	**10.84%**
Consumer Loans[45]	**9.23%**	**3.96%**	**2.96%**	**5.48%**	**10.31%**
Other Loans and Leases[46]	**5.07%**	**0.81%**	**1.21%**	**2.50%**	**5.76%**
U.S. State Obligations	0.70%	0.36%	0.48%	0.91%	0.70%
Other Loans[47]	4.37%	0.45%	0.73%	1.59%	5.07%

Table 6: *Source: Federal Deposit Insurance Corporation, Statisitics on Depository Institutions*

[43] Loans secured primarily by real estate, whether originated by the bank or purchased

[44] Commercial and industrial loans, excludes all loans secured by real estate, loans to individuals, loans to depository institutions and foreign governments.

[45] Loans to individuals for household, family, and other personal expenditures including outstanding credit card balances and other secured and unsecured consumer loans

[46] Includes obligations (other than securities) of U.S. states and political subdivisions including nonrated industrial development obligations, total acceptances of other banks, and loans to other depository institutions

[47] Includes all other loans on a consolidated basis plus prepaid taxes and insurance on mortgage loans; leases financing receivables; loans to depository institutions

Table 7, Deposits as Percent of Total Assets by Deposit Type, September 30, 2012:

	All Commercial Banks	Very Small <$100M	Small >$100M and ≤$1B	Large >$1B and ≤$10B	Largest ≤$10B
Deposits held in domestic offices	62.58%	85.18%	83.87%	77.77%	58.63%
Transaction accounts[48]	9.97%	28.63%	19.96%	10.44%	8.73%
Demand deposits[49]	8.00%	16.20%	11.79%	7.22%	7.61%
Nontransaction accounts[50]	52.61%	56.55%	63.91%	67.33%	49.90%
Money market deposit accounts	29.52%	11.51%	18.17%	29.37%	30.85%
Total time deposits[51]	11.49%	35.02%	31.40%	23.50%	8.01%
Noninterest-bearing deposits[52]	17.81%	16.37%	15.35%	15.62%	18.30%
Interest-bearing deposits[53]	44.77%	68.81%	68.52%	62.15%	40.33%
Core (Retail) deposits[54]	56.08%	80.32%	76.44%	68.71%	52.48%
Estimated insured deposits	49.33%	77.57%	71.81%	61.03%	45.57%
Brokered deposits	4.31%	1.24%	2.93%	5.18%	4.39%
Deposits held in foreign offices	11.05%	N/A	0.03%	0.56%	13.36%

Table 7: *Source: Federal Deposit Insurance Corporation, Statisitics on Depository Institutions*

[48] Sum of demand deposits, NOW accounts, and Automated Transfer Service accounts
[49] Total demand deposits included in transaction accounts, commonly checking accounts
[50] Sum of MMDAs, other savings deposits, and all time deposits
[51] Total nontransaction time deposits
[52] Sum of total demand deposits and noninterest-bearing time and savings deposits held in domestic offices
[53] Sum of interest-bearing time and savings deposits held in domestic offices
[54] Equal to total domestic deposits minus time deposits of more than $250,000 and brokered deposits of $250,000 or less

Table 8, FDIC SDI Data Download (Assets and Liabilities, Income and Expenses, and Profitability and Condition Ratios:

Observations:	**174,010**
Variables:	**131**
Variable	**Variable Label**
cert	Certificate Number for FDIC Insurance
docket	Unique ID # for institutions that were chartered
rssdhcr	Unique ID Number for top bank holding company
fed_rssd	Unique Federal Reserve ID Number
hctmult	Type of Holding Company
name	Bank Name
city	City of Bank Headquarters
stalp	State Code for Bank Headquarters
zip	zip code for bank headquarters
repdte	Report Date
intinc	Total Interest Income
eintexp	Total Interest Expense
nim	Net Interest Income
elnatr	Provision for Loan and Lease Losses
nonii	Total Noninterest Income
ifiduc	Gross Fiduciary Activities Income
iserchg	Service Charges on Deposit Accounts
igltrad	Trading Account Gains & Fees
idothnii	Additional Noninterest Income
nonix	Total Non-interest Expense
esal	Salaries & Employee Benefits
epremagg	Premises & equipment Expense
ideoth	Additional Noninterest Expense
idpretx	Pre-Tax Net Operating Income
iglsec	Securities gains (losses)
itax	Applicable Income Taxes
ibefxtr	Income Before extraordinary items
extra	Extraordinary gains, net
netinc	Net Income Bank
netimin	Net Income due to Minority Int
netinbm	Net Income- Bank & Minority Int
ntlnls	Net Charge-Offs
eqcdiv	Cash Dividends
eqcstkrx	Sale, conversion, retirement of capital stock, net

noij	Net Operating Income
filenum1	Indicator of FDIC Size Class for INC&EXP
idntilr	% of unprofitable institutions
idntigr	% of institutions with earnings gains
intincy	Yield on earning assets
intexpy	Cost of funding earning assets
nimy	Net interest margin
noniiy	Noninterest income to earning assets
nonixy	Noninterest expense to earning assets
noijy	Net operating income to assets
roa	Return on Assets
roaptx	Pretax return on assets
roe	Return on equity
roeinjr	Retained earnings to average equity (YTD only)
ntlnlsr	Net charge offs % of loans
elnantr	Provision for loss as % of charge offs
iderncvr	Earnings coverage of net charge-offs (X)
eeffr	Efficiency Ratio: non-int exp as % of NII + non-int
astempm	Assets per employee ()
iddivnir	Cash dividends to net income (ytd only)
lnatresr	Loss Allowance to Loans
lnresncr	Loan loss allowance to noncurrent loans
nperfv	Noncurrent assets plus REO to assets
nclnlsr	Noncurrent loans to loans
lnlsdepr	Net loans and leases to deposits
idlncorr	Net loans and Leases to core deposits
eqv	Equity capital to assets
rbc1aaj	core capital leverage ratio
rbc1rwaj	Tier 1 risk-based capital ratio
rbcrwaj	Total risk-based capital ratio
asset5	Average Assets (YTD)
ernast5	Average earning assets
eq5	Average equity
lnlsgr5	Average loans
filenum2	Indicator of FDIC Size Class for RATIOs
merge1	Result of merging income & ratios
numemp	Total Employees
asset	Total Assets
chbal	Cash & Balances due from Depository Institutions
chbali	Interest-bearing Balances
sc	Total Securities

frepo	Fed Funds Sold & Reverse Repo
lnlsnet	Net Loans and Leases
lnatres	Loan Loss Allowance
trade	Trading Acct Assets
bkprem	Bank Premises and Fixed Assets
ore	Other Real Estate Owned
intan	Goodwill and Other Intangibles
idoa	All Other Assets
liabeq	Total Liabilities and Capital
liab	Total Liabilities
dep	Total Deposits
depi	Interest-bearing Deposits
depdom	Deposits held in Domestic Offices
iddepinr	Estimated % Insured
frepp	Fed Funds Purchased and Repo
tradel	Trading Liabilities
idobrmtg	Other Borrowed Funds
subnd	Subordinated Debt
idoliab	All Other Liabilities
eqtot	Total Equity Capital
eq	Bank Equity Capital
eqpp	Perpetual Preferred Stock
eqcs	Common Stock
eqsur	Surplus
equptot	Undivided Profits
eqconsub	Equity, Minor Interest in Consolidated Subs
nclnls	Noncurrent Loans and Leases
ncgtypar	Noncurrent Loans which are wholly or partially U.S. guaranteed
oaienc	Income earned, not collected on loans
ernast	Earning Assets
asstlt	Long-term Assets (5+ years)
asset2	Average Assets (Quarterly)
rwaj	Total Risk-Weighted Assets
avassetj	Adjusted Average Assets for Leverage Capital Purposes
oalifins	Life Insurance Assets
oalifgen	General Account Life Insurance Assets
oalifsep	Separate Account Life Insurance Assets-Consolidated
oalifhyb	Hybrid Account Life Ins Assets- Consolidated
voliab	Volatile Liabilities (Fed Funds Purch & Repos)
othbfhlb	Other Liabilities from the FHLB
lnlssale	Loans & leases Held for Sale

ucln	Unused commitments to Make or Purchase Loans
rbct1j	Risk-Based Tier 1 Capital
rbct2	Risk-Based Tier 2 Capital
uc	Unused Commitments-- Total
obsdir	Derivatives
filenum3	Indicator of FDIC Size Class for A&L
merge2	Merge indicator from merging inc_ratios with assets
fdic_categ	Type of FDIC-regulated institution
year	Report Year
fedfunds	FED Funds Rate -- average for year
GS10	Treasury 10 year- Constant Maturity -- average for year
GS2	Treasury 2 yr Constant Maturity -- average for year
GS5	Treasury 5 year - Constant Maturity -- average for year
mortg	Mortgage Rate - average for year
mprime	Prime Rate

Table 8: *Source: Federal Deposit Insurance Corporation, Statisitics on Depository Institutions*

Table 9: Pretax ROE and Pretax ROA Summary Statistics by Bank Group, 1992-2012:

Panel A: Pretax ROE				
Group	**Average**	**Standard Deviation**	**Minimum**	**Maximum**
Assets > $10B	24.31	18.72	-113.12	190.88
$10B ≥ Assets > $1B	18.11	14.86	-378.22	115.72
$1B ≥ Assets	13.49	17.42	-3,041.29[55]	830.95
Panel B: Pretax ROA				
Group	**Average**	**Standard Deviation**	**Minimum**	**Maximum**
Assets > $10B	1.61	0.97	-4.56	5.71
$10B ≥ Assets > $1B	1.50	1.04	-7.94	9.21
$1B ≥ Assets	1.36	0.97	-10.1	11.59

[55] In preparing the DuPont analysis, we filtered the extreme observations (see Footnote 19 on Pg. 28 for specific filters applied) by filtering on the individual components of the analysis. Consequently, some banks with very low levels of equity had extreme values of ROE and ROA. As a robustness check, we added additional filters to the DuPont analysis. As a result of this check, the analysis did not significantly change.

Table 10: Profitability Decomposition Summary Statistics, 1992-2012:

Summary Statistics (1992 - 2012)								
	All Groups		Group 1		Group 2		Group 3	
Variable	Mean	Stan. Dev.	Mean	Stan. Dev.	Mean	Stan. Dev.	Mean	Stan. Dev.
Components of Pretax ROAA								
Net Interest Margin / AA	4.385	0.832	3.843	0.845	4.085	0.816	4.402	0.828
Avg. Earning Assets / AA	0.917	0.027	0.880	0.036	0.908	0.030	0.918	0.027
Net Interest Income / AA	4.015	0.736	3.384	0.754	3.704	0.719	4.034	0.732
Non-Interest Income / AA	0.815	0.634	1.871	1.042	1.249	0.937	0.787	0.598
Total Operating Revenues / AA	4.830	1.054	5.255	1.275	4.953	1.198	4.281	1.044
Op. Exp. / AA	3.204	0.980	3.212	0.985	3.075	0.988	3.210	0.979
Pretax Preloss Income / AA	1.626	0.832	2.043	0.814	1.878	0.857	1.611	0.828
Credit Costs / AA	0.282	0.410	0.467	0.549	0.400	0.485	0.275	0.403
Pretax Income	1.344	0.979	1.576	0.981	1.478	1.056	1.336	0.975
Components of ROE								
Asset Utilization (Revenue/AA)	4.830	1.054	5.255	1.275	4.953	1.198	4.821	1.044
Op. Margin (Pretax NI/Revenue)	27.136	21.651	29.273	19.350	28.843	22.005	27.045	21.649
Lev. Ratio (AA/Tang. Comm. Eq.)	10.701	4.304	15.181	5.886	12.509	2.921	10.586	4.302
Prtx ROE (Prtx NI/Tang. Comm. Eq.)	13.761	17.382	24.312	18.724	18.111	14.858	13.487	17.423
Memo Items								
Overhead Ratio (Op. Exp./Rev.)	66.759	16.627	12.928	21.891	62.489	15.094	66.989	16.684
Credit Costs (Credit Costs/Rev.)	6.105	9.958	9.372	12.077	8.668	11.920	5.967	9.824
Number of Observations	**146,289**		**1,115**		**6,076**		**139,098**	

Table 11: Pretax ROE Analysis of Variance:

Dependent Variable: Pretax ROE												
	All Groups			Group 1			Group 2			Group 3		
Variable	Coefficient	t-stat	Adj. R^2	Coefficient	t-stat	Adj. R^2	Coefficient	t-stat	Adj. R^2	Coefficient	t-stat	Adj. R^2
Asset Utilization	1.219	140.05	0.13	1.294	16.95	0.21	1.286	36.10	0.19	1.201	133.66	0.12
Operating Margin	0.963	655.24	0.76	0.974	39.90	0.60	1.017	135.44	0.76	0.959	647.95	0.76
Leverage Ratio	0.789	114.57	0.09	1.094	18.04	0.24	0.909	24.51	0.10	0.755	105.41	0.10
Observations	137,176			1,054			5,694			130,428		

Table 11: Coefficients were obtained by regressing each individual variable with Pretax ROE; all coefficients are statistically significant at the 1% level.

Table 12: Pretax ROA Analysis of Variance:

Dependent Variable: Pretax ROE												
	All Groups			Group 1			Group 2			Group 3		
Variable	Coefficient	t-stat	Adj. R^2	Coefficient	t-stat	Adj. R^2	Coefficient	t-stat	Adj. R^2	Coefficient	t-stat	Adj. R^2
Net Interest Margin / AA	0.45	157.4	0.15	0.41	12.7	0.13	0.57	38.4	0.20	0.45	155.0	0.15
Average Earning Assets / AA	7.67	83.2	0.05	3.01	3.7	0.01	3.15	7.0	0.01	8.33	87.2	0.05
Net Interest Income / AA	0.57	180.9	0.18	0.48	13.3	0.14	0.69	41.4	0.22	0.58	179.7	0.19
Non-Interest Income / AA	0.24	59.4	0.02	0.29	10.8	0.09	0.28	19.7	0.06	0.23	53.2	0.02
Operating Revenue / AA	0.36	162.6	0.15	0.36	17.8	0.22	0.42	41.9	0.22	0.36	155.7	0.15
Operating Expense / AA	-0.35	-144.0	0.12	-0.08	-2.6	0.01	-0.21	-15.9	0.04	-0.36	-144.5	0.13
Pretax Preloss Income / AA	1.07	841.1	0.83	1.00	49.4	0.69	1.10	153.5	0.80	1.07	832.0	0.83
Credit / AA	-1.29	-246.3	0.29	-1.00	-22.4	0.31	-1.31	-58.6	0.36	-1.31	-241.2	0.30
Observations	**146,283**			**1,114**			**6,076**			**139,093**		

Table 12: Coefficients were obtained by regressing each individual variable with Pretax ROE; all coefficients are statistically significant at the 1% level

A. Appendix – The Savings and Loan Crisis

In many regards, the Savings and Loan Crisis was the beginning of a major transformation of the United States banking industry. The Savings and Loan Crisis originated in part because of the challenging interest rate, regulatory, and competitive environments of the 1980s. Each of these factors was exacerbated by the fundamental differences between savings and loans associations and other financial institutions. Namely, S&Ls relied heavily upon on using money borrowed short-term to fund long-term loans. Without being involved in much else other than this type of lending, S&Ls were more susceptible to interest rate risk. In the late 1970s and early 1980s, interest rates rose dramatically. Further complicating the position of the S&L industry was a rigid regulatory system that capped the amount of interest they could pay on deposit accounts as well as the types of products S&Ls could offer. At the same time, S&L competitors such as commercial banks did not face these caps or restrictions on products. In response to the difficult competitive system, regulators reformed the regulatory system. Unfortunately for the S&Ls, they responded too aggressively to the regulatory changes and overextended themselves with risky loans.

Precursors to the Crisis

In the 1960s and the 1970s, S&Ls faced a growing number of challenges. First, interest rates during the 1960s and especially the 1970s trended upwards.[56] Since lenders often borrow short-term in the form of deposits and lend long-term, rising interest rates can be problematic because lenders' liabilities reprice faster than their assets. Exacerbating the repricing problem was that, during these decades, the yield curve did not shift in a parallel fashion. Short-term

[56] http://research.stlouisfed.org/fred2/series/DGS10/

rates, as measured by the 3-Month U.S. Treasury Bill, increased from 2.7% in 1962 to 15.0 % in 1981.[57] Over the same period, 10-year U.S. Treasury Bonds interest rates increased from 4.1% to 12.6% in 1981.[58] Since S&Ls relied on short-term variable-rate deposits to issue long-term fixed-rate mortgages, it is clear that they would have trouble as interest rates increased. The S&Ls, however, did not face only a challenging interest rate environment.

In addition to the difficulties posed by changing interest rates, S&Ls faced increasing competition as they began to compete with commercial banks and, later, money market mutual funds for savings. These different challenges caused the regulators to become concerned about the health of the S&L Industry. In 1966, as a means of protecting the industry from the competition for deposits, the Federal Home Loan Bank Board got Congress to pass limits on savings and time deposit rates and maturities (Woerheide, 1984 8-9 and Barth, 1991 19). At their September 1966 inception, Regulation Q allowed the S&Ls to pay 4.75% on passbook savings accounts.[59] In contrast, 3-Month T-Bills were paying 5.37%.[60] Even though a savings account is not directly comparable to a 3-Month T-Bill as far as maturity goes, the two are pretty similar. With the differences between returns in these two types of investments, it is clear that there would be an incentive for savers to move their funds to where they could obtain a higher return. However, even though the demand for more attractive savings vehicles was present, the appropriate products did not yet exist in the marketplace. During the 1970s, increasing inflation brought about innovations for those looking to earn a higher return than those allowed by Regulation Q (Barth et al, 1992 61).

[57] http://research.stlouisfed.org/fred2/graph/?s[1][id]=TB3MS
[58] http://research.stlouisfed.org/fred2/graph/?s[1][id]=DGS10
[59] Woerheide, 13.
[60] http://research.stlouisfed.org/fred2/graph/?s[1][id]=TB3MS

New Investment Products

To enable smaller American savers to achieve higher rates of return, new, less regulated investment vehicles were created by the financial services industry. In 1973, money market mutual funds (MMMFs) were created to allow customers to earn more interest than could be earned in S&L savings accounts. An important feature of the MMMFs was that the interest rates they paid were not capped by regulation (Barth, 1991 19). Since the S&Ls were not allowed to pay market rates for their deposits, savers moved money out of the S&Ls into the MMMFs. However, money did not only flow out of the S&Ls to other investment opportunities; Money also flowed back in during periods when market rates declined and the S&L savings accounts paid above market interest rates. The flow of funds in (reintermediation) and out (disintermediation) of the S&Ls presented a significant challenge from an operational standpoint because lenders need a certain amount of deposits to support the loans they have made. Large amount of inflows and outflows in short-term deposits, made it more difficult to properly fund and make long-term loans. Overall, the interest rate ceilings and the creation of new savings vehicles such as MMMFs left the S&Ls in a risky position (FDIC History of S&L Crisis).[61] In fact, by 1982, the amount of money in MMMFs equaled the amount of money held as demand deposits in banks (Barth et al, 1992 61).

Deregulation of the Savings and Loan Industry

The S&L industry remained in a risky position all throughout the 1970s, but high inflation and general economic weakness in 1979 caused some S&Ls to struggle. Subsequently,

[61] http://www.fdic.gov/bank/historical/s&l/

Congress began to look for ways to deregulate the industry. Initially, Congress looked to relax the regulations preventing S&Ls from offering a wider range of products as well as Regulation Q. First, the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) was passed. The DIDMCA gradually ended the interest rate ceilings, made NOW accounts nationally available, increased the limit for deposit insurance to $100,000, and allowed the S&Ls to offer checkable deposits. Secondly, the Garn-St Germain Depository Institutions Act of 1982 was signed into law, allowing banks to offer money market deposit accounts and allowed the S&Ls to increase commercial lending. Another aspect of deregulation was the relaxation of capital rules. Regulators felt that reduced capital standards for S&Ls would enable them to make it through the difficult business environment of the early 1980s (FDIC *History of the Eighties,*1997 175-6). In general, the Act caused banks and S&Ls to increase their lending as their environment became more competitive (FDIC *History of the Eighties,* 1997 10).

As a result of a reduced regulatory burden on both the asset and liability sides of their balance sheets, S&Ls expanded their business rapidly. For example, the FDIC notes in its study of the Crisis that "S&L assets increased from $686 billion to $1,068 billion, … more than twice the growth rate at savings banks and commercial banks" (FDIC *History of the Eighties,* 1997 178). However, the expansion of S&Ls brought about new risks. On the liability side of their balance sheets, the phasing out of Regulation Q forced S&Ls to pay market rates of interest on their deposits, reducing S&L net income (Barth et al, 1992 68-9). At the same time, S&Ls were allowed to offer a wider variety of products beyond the residential mortgages they had historically offered. S&Ls, in combination with commercial banks, increased the proportion of higher risk loans made. These higher risk loans included construction and development loans as

well as loans secured by nonfarm, nonresidential real estate, or commercial mortgages. Deregulation allowed S&Ls to expand lending in these categories because part of the reforms increased demand for these products. For example, demand surged after 1981. The increased lending activity did not pose much of a problem until further reforms were passed in 1986 that strongly reduced demand for these commercial real estate loans. The result was general overbuilding and increases in the number of loan defaults (Barth et al, 1992 76). The percent of home mortgage assets to total assets on S&L balance sheets shows the change in S&L lending behavior. In 1980, before the major reforms and deregulation, the percent of home mortgage assets to total assets for S&Ls was 66.5%. By the end of 1989, this had fallen to 40.7% (Barth, 1991 25). The regulatory changes to the liabilities and assets of the S&Ls brought about significant change in the way the industry operated.

In addition to the increase in riskier lending by S&Ls, the FHLBB, experienced difficulties in regulating the industry in the face of deregulation. Members of the industry as well as politicians pressured regulators to not be as concerned about the sudden growth in the industry and the number of insolvent institutions. By 1983, even as interest rates had dropped significantly and the industry returned to profitability, ten percent of the S&L industry still faced insolvency (Barth, 1991 25). Still, the FHLBB did try to prevent institutions with low net worth from growing as fast while increasing overall net worth standards and reforming accounting practices (FDIC *History of the Eighties,* 1997 178).

For a time, the rapid growth of the S&L industry enabled institutions to greatly increase their net income. As soon as interest rates declined, subsequently causing bank net income to

increase in 1983, S&L industry net income reached a high of $3.7 billion in 1985 (Barth, 1991 25). After this point, the overbuilding that came as a result of deregulation of the commercial lending market turned sour for the S&L industry. Property values declined and the Federal Savings and Loan Insurance Corporation (FSLIC) was forced to step in to resolve the crisis. The FSLIC ran into problems in resolving the insolvent banks because it was not adequately capitalized. Although it held an implicit government guarantee, the FSLIC did not hold enough actual reserves that had been paid in by the industry to resolve a crisis of the magnitude of the S&L Crisis (FDIC *History of the Eighties,* 1997 178). The lack of reserves forced the FSLIC to delay when closing insolvent institutions until they had enough reserves. In 1980, the average insolvency required five months to resolve. By 1988, the average insolvency had increased to 42 months (Barth, 1991 25). Needless to say, the delay and the overall cost to taxpayers necessitated further reforms to the financial regulatory system.

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